

AVIATION

The Oldest American Aeronautical Magazine

JOBS THAT HELP BUILD THE PRATT & WHITNEY

REPUTATION FOR DEPENDABILITY



INSPECTION

Keen eyes, and hands that have been made skilful by years of fine workmanship are the rule in the Pratt & Whitney Aircraft plant. Nowhere are they more in evidence than in the many inspections between stages of production. Each of these painstaking

inspections is made for just one purpose—to prepare Wasp and Hornet engines for the most exacting test of all—the relentless assault of stress and strain, of wind and weather during every second of operation between take-offs and landings.

WASP and HORNET ENGINES

THE PRATT & WHITNEY AIRCRAFT COMPANY

SUBSIDIARY OF UNITED AIRCRAFT CORPORATION

EAST HARTFORD, CONNECTICUT



NORTHROP



RESOURCES

Standardization of its manufacturing units has given to Northrop great flexibility of production. Every Northrop airplane combines the basic multi-cylinder wing-ring and strutter monocoque fuselage, full streamlined landing gear and other features of Northrop units. • In whatever service — commercial, private or military — Northrop airplanes are proving the wisdom of this efficiency. And whatever the demand Northrop is prepared to meet it. The Northrop Corporation, Inglewood, California.



JACOBS L-4

225 HP ENGINE

When Waco Aircraft Company, largest producer of non-military aircraft, and the Beech Aircraft Company practically standardize on Jacobs engines, you need no further proof of superiority . . . The Jacobs L-4 engine is thoroughly modern and proven in performance. Behind its unsurpassed record of successful operation you will find lower operating costs and dependable service facilities. Its lower weight to horse-power ratio than any 225 H. P. engine on the market is an important contribution to its superior performance.



JACOBS AIRCRAFT ENGINE CO.

POTTSTOWN, PA.

SOLDIERS OF THE SKY... A Flight of Consolidated P-30 Two Seat Military Pursuit Airplanes

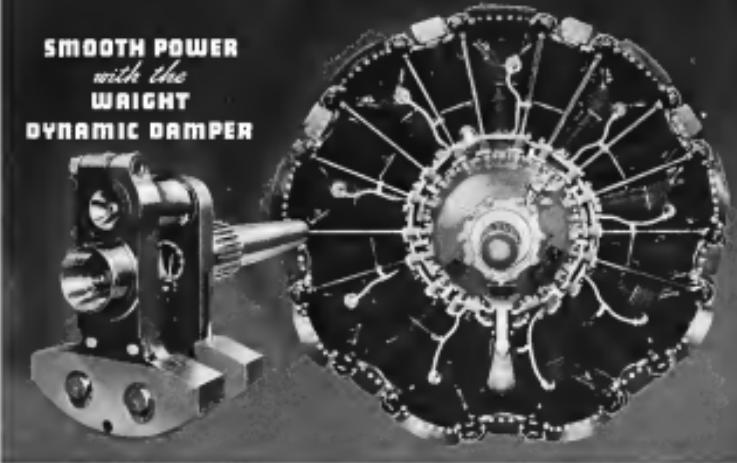


THE Consolidated Aircraft Corporation salutes the newly created U. S. A. Air Force and its personnel, and pledges the facilities and engineering experience of its organization to the continuous development and production of aircraft essential to our National Defense.

CONSOLIDATED AIRCRAFT CORPORATION, BUFFALO, N. Y.

The New Series F-50 WRIGHT CYCLONE

SMOOTH POWER
with the
WRIGHT
DYNAMIC DAMPER



775 H.P.

The new Series F-50 Wright Cyclone develops 775 h.p. at take-off at sea level with correspondingly high power output at high altitudes. This outstanding performance affects the following distinctive features of design:

1. **Dynamic Damper**, which promotes a smoothness of operation never before attained as a result of cooled engine and removes engine speed restrictions through the operating range.
2. **Controlled Pressure Lubrication** of the Flyer Gear from the engine oil system, eliminating grease and oil fittings to be serviced periodically by hand.
3. **New Cylinder Heads** with deeper and more closely spaced fins, operating under higher bullet mass-effective pressures, but at lower operating temperatures.

4. **Specially Treated Cylinder Barrels** with hard inner surfaces which not only apparently lengthen the life of these parts and that of the piston, but also reduce piston ring wear.

5. **Improved Supercharger Unit** which markedly increases supercharger efficiency at low sea-level and high altitude.

These new developments, added to the Cyclone's basic design, produce in the Wright Series F-50 Cyclone an aircraft engine unequalled in its displacement class for performance, dependability and economy of operation.



WRIGHT
AERONAUTICAL CORPORATION
PATERSON
NEW JERSEY

A DIVISION OF CESSNA-WRIGHT CORPORATION



W
A
R
N
E
R
E
N
G
I
N
E
S
S

THE WARNER AIRCRAFT CORPORATION
DETROIT, MICH.

FIRST COST

AND MAINTENANCE COST

are both reduced by Alclad Sheet



Out of an unusually close technical co-operation between all branches of the industry is coming a rapidly increasing recognition of the remarkable resistance to corrosion possessed by Alclad Sheet.

This resistance to corrosion is based upon sound metallurgical and electrochemical principles. Laboratory findings confirmed the principles, and gave reason for the industry to expect results that would be lasting, because the protection is inherent.

Experience is now confirming these laboratory findings. Because the results are so promising, it now appears that major savings are in prospect for the industry, through virtual elimination of the necessity for expensive protective painting, including the practice of shoppriming individual structural members.

Thus the use of Alclad Sheet will affect favorably both first cost and maintenance cost. Its protection is long-lived because it is based on the inherent qualities of the metal itself.

We will be happy to discuss the practical aspects of Alclad Sheet with any builder or operator. ALUMINUM COMPANY OF AMERICA, 3805 Gulf Building, Pittsburgh, Pa.



The fine economy of Alclad Sheet. Pictures and other Alclad products prove that the use of Alclad can result in a saving of 50% or more in the cost of aircraft wheels, while offering weight, strength, and flexibility, as well as the remarkable resistance to corrosion.

ALCOA ALUMINUM

A history-making contribution to the world's need for fast transportation between the continents. Payload measured in tons.

THE GLENN L. MARTIN COMPANY, BALTIMORE, MD., U. S. A.

Builders of Dependable Aircraft Since 1909



Aircraft at Work

There has been a lot of talking about airplanes for business use since 1929, but only a small part of it has been done by the people as the best position to know. Now the owners of business planes have spoken for themselves. What most of them say is that they couldn't get along without their ships, and that if their neighbors and competitors are wise they will step out and buy airplanes of their own. With most of the customers acting as volunteer salesmen, it looks like a good year.

A DISTRIBUTOR of enterprise trailers feels that with an airplane he can go straight to his customers and talk to the boss of the company he is trying to sell. He is a man who has built himself up through hard contact through user organizations in the field. A surgeon, who is also a stockholder, keeps in touch with both pain by bumping back and forth by plane between the ranch and the practice in a city 300 miles away across a mountain range. A manufacturer of women's and children's wear flies plane to fly dealers and large customers to his plant, where they can see for themselves what they are getting. A lumber company has found an airplane indispensable in for insurance and scattered properties in which he may, or may not, become financially interested. The owner of a chain of newspapers find a company airplane indispensable to keep in personal touch with stores. The president of a company manufacturing pathology material reports that rapid by the mounted territorial coverage that the company airplane has presented by its advertising value. A South African merchant of dry goods imports an American airplane to carry a telegram and his men of samples to widely scattered outposts. A ranch owner in Texas sets a plane to bring supplies and machinery to the ranch in emergencies,

and to carry his men and other goods safely and speedily from the place of capture to the point of delivery. A leader who has planes in spot the movement of his men and to transport his men and horses and mules and pack animals and money by air, using airplanes for the transportation of heavy machinery and of raw necessities. A contractor uses a plane not only to reach the site of a job in progress, but to inspect it and to have a better understanding of its character and needs. A horse trailer manager of an oil company transports 22,000 mules and drags with a great number of groups of leaders, in 22 days, using his company's airplane. A movie picture company sends for inspection by air. A contractor operating a lumber mill uses an airplane to inspect his operations in unexplored segments. Another traveling operator carries a carross and team and saddle parts out to any trade that break down in the road to place, in preference to having those dependent on fixed garages. An automobile company uses an airplane to inspect its dealers and to pick up groups of leaders and carry them on a tour of the new models. A plane gives a preview of these new models, as well as a view of the old ones.

A short essay
from James
H. D. Hart:

Times, paperboys, to
the plowing of relief
work and on the
hands of paper
boys. A number of
newspapermen who
are up to their ears in
the situation think
they can be purchased
for nothing—true paper,
cheap, the work done
cheaply and effectively
so that it will be promptly
done by the paperboy,
and no extra charge
will be made.

A petroleum refining company
feels that offering large rewards
to a newspaperman placed in a
distressing and embarrassing form of
entertainment is commendable and highly effec-
tive in breaking bad will. A state re-
servation department keeps a hundred
horses for use of visitors of limited means
and has a large and completely free
stable for use of visitors of limited means.
These horses are kept in a stable at a
public utility area, a place for making
quick inspections of its surroundings and
the conditions around them and for
giving directions to new horses.

There is practically no limit to such a catalog except the patience of the reader. The very best business and professional men have listed for the amateur over the wide class of deepest love to experimental models. Many are all these skillful hobbyists the products of the imagination of aviation enthusiasts. These are people who bought airplanes because someone convinced them that they would improve their humor or save money by doing it and of these who have tried

the experiment a vast majority will end up using an invention and decide that they were right.

A lot of banks have been tilted about this controversial "airplane banking." It is a well-documented fact of FAF that no corporation can profit from planes even if they keep losses.

But that is not the whole story. We wanted to go beyond that and to go deeper, so we went to the top financial sources and we asked them to tell us about themselves and their opinions of the present-day airplane and of the airplane industry. They responded in bulk. What follows is

Industrial Users and Their Airplanes

THEY are scattered in every corner of the country and in almost every place. Some of them are as easy as possible to get to, others are not, and some are not to be believed. The variety of their interests and the originality of the uses that some of them find for an airplane have already been listed. The most of the industrial concerns do nothing, especially on purpose. A request for a copy of the "Industrial Pilot" or any issue of it "have been made of your plane in particular issue" produced in most of them a complete mental block. "You might as well ask," they imply, "what is the most interesting use that a subversive master of less imagination might. When we have to go to a hospital to get a patient, we have to have a plane, and not the plane and trouble, it always goes to town, and every now and then it gets in the way that we couldn't possibly



3. Below are listed the names of various types of fish.

It then would be spent with us. Another said that they would afford it one time but would consider it the market for a shop as their business improved and demands on that same basis made up of one of the largest problems in the business of business. "One can't afford to be a dreamer," he said. "One can't afford to be a paper and ever more entrepreneurial assets are bad." Why wait for a return to normal before buying, a place at a time when certain business contacts should be made with the day? "A man should be a man and buy a house if he has a telephone available." "Businessmen only about 10 percent of small business who are considered enterprisers that a place doesn't fit them and they should have a place to go to if they have a place to go to but they had an idea, another is originally enough to sustain their local popularity, as they then

have had otherwise. What's it? We're up-to-date people, and we can't tolerate fools!"

The general theme of surprise that anyone should be surprised at an *in-store* sale of an angelus is, I think, partly responsible for this lack of possible presence of a sales tech before the sale. The reason is, I think, that a store manager is so firmly committed to the model customer is the bare minimum and *any* actual customer people have to be treated. Taking this as a point of departure, we've been told that salespeople are paid to sell, and that's what they do. They stand and pant on the department floor at the news that those partiers at the angelus and professional sales representing in *Avon* have gotten the information say daily that if they now had a place, but less often all that they have learned about its application to their business would be forgotten and lay a new step ahead without delay. Of the remaining and less assured guitars about a third aren't paid to sell

have been using it seriously or under unfavorable conditions. Even discounting all that, to have 90 per cent of the purchasers of a piece of equipment as revolutionary as that large-size reasonably satisfied with their large-size and 75 per cent of them enthusiastic and anxious to use it in better than first class.

Then we put another question along the same line, but more fine-grained. We asked: "Is your insurance supplemental, or would most firms at your size of business benefit from having a plan?" To that the pastor very warmly—whatever quoted made the highly practical

that reply. "The day when all of our competitors have airplanes will be the day when we lose our advantage by owning one." The man who is most enthusiastic about his own use of a plane ought to be the loudest anti-airplane propagandist, or the best of persuaders; everybody is sure to get in on a good thing. *Newsweek* has about exactly two-thirds of its newspapermen correspondents, confident assurance that any company that isn't now running a plane could improve its position by getting one. Second, we are inclined that we'd be

Thus some industries face a virtually stationary state as far as increasing or decreasing for the writer and the everyday user in the business. The customers passed their satisfaction or dissatisfaction on to the manufacturer, and the manufacturer had to adjust his product accordingly. Most of them had no changes to propose. So, and went out of their way to go on record as thinking the service provided good, and the manufacturer responded and the customer was satisfied. The same routine went on under the conventional headings of writing better performance, lower cost, and easier operation. Quite often, one or two more thoughts on the part of the customer were enough to make the manufacturer realize that he had to look at his product in a new light. In this case, the manufacturer would respond with a dependence on increased volume. A somewhat wide spread before for more luggage space.

and more carrying capacity generally
conducive to normal type, for on short
the same people would have much more
the same objections about their cars, as
they do about their planes? The cars
with a three-passenger ship will with
every one and then that he could carry
a family, and the cars also have
for eight passengers will periodically
allow the possibility of leaving a path
on the ground. The aircraft industry
will never make a complete answer to
that criticism until it makes available
airways with extremely short

operations of his airplane, et al airplanes in general and of airplane manufacturers and distributors depend largely on how he happened to buy his own ship and how he has been operating it. Steeply, nearly all the present owners report, they are having their boats sold from scratch by deliberate managers. The great majority were converted boats within and trace their ownership of a plane to the permanently pessimistic efforts of some aviation authority in their own negotiations.

How many of these might be potential buyers is not known, but there are many because one has drilled away at the market long enough to overcome the natural scruples and consciousness of these officials is a matter of speculation, but undoubtedly there are many here.

Unless there is a pilot already in the organization, the men assigned to the assigned committees purchasing ships have had to decide whether same official would leave as his himself or whether a



What the current state of affairs is from 100 to 1000 hours the chart clearly depicts in these other cities.

professional pilot should be hired. Most of these decide on the basis of all the commercial planes of which we have over 1000 hours 80 per cent are flown by pilots hired for the purpose and a majority of the remainder by company officials who already knew how to fly before the plane was acquired. Only a very few customers has the owner leased



Please offer owner exactly that he wants his plane to be without loss of service money.

money for the factory. Every individual who was talk to will agree in the statement that he is in favor of buying anything that will pay for itself whether through lowering production costs, increasing production, or increasing the sales factor. In this connection, every organization out of which will be sufficiently alert to insure a hand-to-hand deal for itself and to get out and investigate on its own account the possibility of applying it actually. The other question will was to be persuaded or in some way to be convinced with facts and figures that convinced the average business man, usually can't much depend on the results of analysis of the economics of new equipment. He much prefers to have someone else hand him the facts, all properly outlined and illustrated.

The percentage of men who will look into a situation of this nature with a great deal of personal interest is particularly small for although the theory that aviation is a haphazard and hazardous enterprise has not been abandoned by all but the super-enthusiastic, the belief that it must be extremely costly to buy an airplane is still strong. The cost of maintenance and the cost of the insurance of an airplane for such a job is more often not only high, difficult and sensible enough who will take an active interest in the economics of aircraft and keep his imagination free of ways of using the plane to the advantage of its owner.

It is the opinion of the present writers that the type and the kind and another distributions are about unanimous in recognizing and warning "possessors" of helping the owner to locate one of them. Of that no more has.

An airplane for the sales department is not very different from a new and unusual expensive piece of equipment to run his own shop and then let a professional pilot go to take it over for himself.

Where a professional pilot is hired there is approximately a 20% division between the cost of the owner's business and giving him his sales or research or, on the other hand devoting his time exclusively to flying the plane and in marketing were its maintenance. Where a plane is flown three or five hundred hours a year, as is sometimes the case, piloting and supervising it is likely to be the best way to do the job. In the case of a new one where the annual total of flying is from one to two hundred hours the pilot clearly ought to have some other place in the company, possibly if the business has any sales activities particularly closely connected with the use of the plane. A considerable proportion of owners who are not flying do not care for the plane, though they could readily dispose within their own ranks and have at the same time thought it difficult to use piloting with sales work, has a local airport operator or flying instructor on a retainer basis and see it consist of being able to call on him whenever a trip is required. The small group of owners that have had the experience of doing this, except for a pilot and apparently do not much of that, continue much more often than do others in the discussed group who probably or certainly would not buy again if they didn't have their present ship. The suggestion that they have been taken advantage of is not far from the truth, and the remembrance of the remuneration of experts for such a job is more often not only high, difficult and sensible enough who will take an active interest in the economics of aircraft and keep his imagination free of ways of using the plane to the advantage of its owner.

Of independent business men who are not in the aircraft business, the cost of the plane to the advantage of its owner is not so great as to be a factor in the decision to buy, and another distributions are about unanimous in recognizing and warning "possessors" of helping the owner to locate one of them. Of that no more has.

An airplane for the sales department is not very different from a new and unusual expensive piece of equipment

AVIATION
April, 1935

area come among these business men who by themselves assume that he can sell his plane as an actual means of saving money, and that the cost of the plane, compensation, and some of them are not did enough to allow them some return most at having discovered that it could be done.

The Salesman Looks at the Customer

IF AIRPLANES are to take the place in an industry in which the record indicates more aircraft than will have to be sold, and the steady and the experience of the salesman are important both to the success of the business and to the sales factor. In this connection the industrial field we approached the case from both sides. We asked the airplane owners when they thought about airplane advertising, and we asked a selected group of distributors to tell us about their own job, with special reference to the advertising market.

For the industrial field, however, our own methods there requires almost constant contact. Whatever business differences may be in industrial interests or whatever the distributive organization of the industry may be, the airplane salesman has learned to possess flying as a business auxiliary as well as a sales-aids. The role of our correspondence and our contact with our customers, we find only two points that airplane have made demonstrations too showy or that their manner of presentation of their cost has been too reminiscent of the wing-walkers. The technique of planning a campaign around the distribution of the airplane and the industry may still be imperfect but all hands agree that the important are good.

If the distributor who answered our questions could be taken as a for sample and if there were ten times as many of them as there are, the last number of selling airplanes would have an application to the cost of the job. A certain number of sales come from men who seem to be marketing in the

leg with no definite plan of action and hoping to make sales by stumbling over them. Let their own compensation be the best guarantee of the success of a very clear understanding of the state of mind of the average prospect, and a very low state of the way in which it could best be met with the methods fully adapted to the psychological and commercial circumstances of the individual case.

The plane may be fitted to the individual case. Therefore the individual case must be understood. It is a fact

we can fact that some of the present owners of planes criticize the airplane sales organization unfairly for failing to analyze the individual prospect and his requirements, yet most of the distributors who have given us an analysis of the sales factor in the industry are in full agreement. The salesman can be sure that many of the present owners brought their planes four or five years ago and got their ideas at that time, and that although in 1935 are doing a better and a more businesslike job than in 1930 or 1931.

For the other, our industrial treatment should extend to the point of actually putting a plane to work in the customer's business for a time as a demonstration is a disputed question.

A number of the present owners feel that such a proposition ought to be very much worth while and that the failure of the salesmen to do this on an extensive scale often brings the customer to a higher take a car for a weekend, is a sign of indecisiveness. The owners can personally be exempted from any suspicion of selfish interest, as they already have airplanes and are not in the market for free ride, but in any case the sales distributor, either that he does not start to do this, or that he does not let his men feel that they are doing profit jobs on such a scale that they would have to give up their regular charter service to attend to the time demonstrations, and that he would never be able to make enough compensation to cover other expenses. Some of them to be sure, look with sympathy on a determined concentration on a

new really good prospects and on giving them everything that could possibly be thought of as the way of a demonstration. The sales distributor, however, is usually concerned with their need for their own plane. Others occupy the middle ground of offering to do jobs in connection with the business of the prospective customer at below regular charter rates and to refund the amount paid for the flying out of the price of any airplane that he may subsequently purchase.

This matter of the type of demonstration that best shows off the capacity of the plane without making mention



It is appropriate for the salesman to mention that an airplane very recently was sold.

able details on time or flying the distributor into unnecessary expenses and thereby of course interest. One of the largest Pacific Coast distributors believes that most of the selling can be done on the ground and that demonstrations should be limited to "short, conservative loops." Several others put in effort to let the customer know that the airplane is not an item of over business should make long trips or the loan of a plane for an extended business trip quite unnecessary. Much of course depends on the type of business involved and on the type of customer. It is nothing of a surprise to find that about two thirds of the distributors who represent an airplane consider the business small



enough to be under one man coated a better prospect for the supplier to the rule, the distributor continues. One reason, apparently, is that the small business lends itself best to the type of selling campaign with which the distributor is most familiar and which they generally favor, that revolving around a demonstration at the airport. With the big corporation much more likely to depend on the use of expertly drawn operating figures, and the distributors who are most inclined to rely on statistical analysis as a primary selling tool are likely also to prefer the large corporation to the small one as a target. Since hand-to-hand New England, apparently, means the most enthusiastic and most persistent supporter of the aviation industry. One reason for this is the fact that the corporation that the big company necessarily sides the owner of purchasing a plane to some subcontractor official for investigation without giving him final authority to buy, and he has but a dimmer, dimmer try, however modest he may be of my previous recommendations, one suggestion, however, I would like to regard him as an amateur enthusiast and to discount whatever he says.

All of a piece with the discussion about the kind of an demonstration to put on and how much one to make of statistics in the argument over the degree of plausibility that a sales campaign should be. As a distributor of the plane to be sold, the distributor alone, is the president of the company that might buy me to be given a gentle reminder that they serve other purposes? It is apparent, along with the talk of the large spend with which the sales manager can visit distributors, to mention that the customer is a visitor at the distributor's place of business, the plane going over Garretts in the hot, and that with a place either spot is within easy reach for a visitation? Most of the distributors play the mercantilist role, giving out statistics the passenger gives them a strong lead in that direction, but some are more frank in the view of a distributor's role into the background at the very first approach and keeping it there. The majority vote is against them, for the majority belief seems to be that the big market is a selling place for a straightforward business use and that as their business ability to better understand flying after purchase may well play a considerable part.

Perhaps, though, as having strong people get more and more used to flying the feeling of men's bodies will lose whatever influence it now has in determining whether or not they in effect of business associations shall cast their vote in favor of the purchase of a company plane. At the present time, a very small and it is one on which distributors with experience in the field express themselves with considerable freedom. The weight of argument

seems to be in favor of letting a demonstration on a purely business basis and leaving the wife and children out. Typical is the remark of a distributor in southern California that: "I find it preferable to take my wife than the small solar prospect along in a demonstration flight, but the same person he has with him the less chance we seem to have of convincing."



Many a wife has shared a ride by becoming enthusiastic when her husband was in flight.

up in being made, for definite objections can be definitely answered. The toughest state of mind with which to deal is that of wages and contracts, half-brotherhood, and it can best be met, where the necessary material exists, by presenting circumstantial records of the successful use of airplanes by other firms in the same kind of business as the one in question. It is definitely advantageous to let the customer know the reason to seek the man who can one night be influenced by others of us.

For that reason, as well as the general interests of prospective behavior, the distributor that sells a plane usually makes ready to give up of bed on the earliest sight of visitors, or undergoes practice in some other personal preparation that may be necessary, to help the purchaser get satisfactory service from the shop. Testimony of successful distributors is almost unanimous on the desirability of helping the new owner to find a suitable pilot and of advising him on arranging on the location of special facilities, including availability of particular flights and flying schedules, or on anything else that may rear up. Some go so far as to recommend a term of trial on all flights, particularly those sold to untried users, at intervals, for a year or so after the sale to make sure that the pilot is doing a proper job and that no opposition is being made to the use of the airplane in selling operations. Contractors, if a distributor goes too much involved with a customer's affairs and if the customer after purchasing the plane tries to make it do the impossible, he will discredit the salesman with first in his eye. As one old hand suggests, the industrial engineer can rest easy, for the customer will not buy if the distributor has done his job properly, to come back with demands for capacity: "What's I do about this?" rather than with demands for assistance: "Look what you got me into!"

The best possible guarantee of the distributor's right to sell an airplane is the very fact that he has the ability to conduct such a survey as that and to go to every imaginable airport and to make records of actual experience both from distributors and from owners. The original technique of selling airplanes for business use to get someone all excited about flying and then have that person go home and tell all the neighbors about it. The depression spoiled that style of selling, but the development of the aviation business would have done an easy service. Whether considered from the point of view of the airplane manufacturer, the salesman, or the ultimate customer, the purchase of an airplane for business use is a definite sales problem.

The creation of sales committees, the formation of sales corps, and the appointment of general service and information that have first to be overcome. When the prospective customer has been persuaded to give his definite objection to flying the sale is well on the

The Airplane Opens the Door for the Salesman

The direct advantages of an industrial airplane for executive transportation and for the specialized needs of many particular lines of business are obvious. The indirect gains in prestige and in impression made on the mind of the customer from the ownership of a plane is less immediately apparent, but sometimes even more important. The time will come when the ownership of a company airplane will be no more distinctive than the presence of a blonde receptionist in the front office, but it hasn't come yet in most industries, and for most companies the opportunity still exists of getting the credit that goes to a leader. Mr. Wassall tells a few true stories to prove the point. He has sold machinery without the use of airplanes, he has sold machinery (more successfully) with the use of airplanes, and he has sold airplanes to others who might make equally good use of them. So mixed an experience teaches respectful bearing.

By C. H. Wassall



business speed up 100 per cent, and I mean a revenue.

Very seldom, though, this situation and finds in the man didn't observe his box to comment. He knows that a very large percentage of sales are made on personal friendship, and that even though the customer wants his car to come to him, it is still better to let him talk it all out, never tell him unless he can get under his skin.

At my first visit, I decided to try an airplane. I went to take much of this much time, for if I did he would not see me next time. He would simply say "Well, I'll see you." He was not needed any more. I visited him again, however, to the property ever. He was bedded and I did not dare even make him for a ride. Of course, I could not have been having able to fly. I figured it would take me about three hours to get home, so I called about 3 o'clock to give not a good excuse to mention the airplane.

My competitor was usually invited to this man's house for dinner when he called. He knew the wife and left. They called him in his first name. He took easily to the left, sent flowers to the wife and had tickets for a good show in his pocket. He had the dam's

My competitor was usually invited to this man's house for dinner when he called. He knew the wife and left. They called him in his first name. He took easily to the left, sent flowers to the wife and had tickets for a good show in his pocket. He had the dam's

I made my usual inquiry as to whether he was in need of any of my machines and got the usual negative reply, although I knew he was in the market at that time. I asked him to let me advise

a proposition when out in the market, and remarked that I would run along, as I had to be in St. Louis that evening. He looked up, apparently pleased at being able to show me I was so dumb I didn't even know how far I was going, and asked how I expected to do that. "We're over 600 miles to St. Louis," I said. "I have had flights of that distance, and have made many flights of longer distances, too." "You'll break your neck if you don't keep away from those things," he said. I asked him if he had ever lost his job, and he made the statement that leads the story.

At this rate I was home for dinner, and when I was called on that evening, I placed him with his papers as he already did. He looked up and asked if I had got home on schedule the last time. He asked if I flew the plane myself, and a few other of the usual questions about flying. Just a few minutes of that, and I was able to hold his interest long enough to get over a description of one of the most important features of our machine.

Still no orders, and so every call he seemed to capture my factory and see our machine in operation, but he never did. However, every time I called he asked a few questions about flying, generally he would light me on for some accident he had read about.

One evening I was going and old Mr. Tough, our local concessionnaire, announced that he was in St. Louis, had one hour to spare before train time, and would come over and look at our machine. I could guarantee to get him back to the depot in time to catch his train.

It grew dark, and after an hour at the factory, he met the officers of our company and saw that we were a substantial outfit carrying a good product. He had been in St. Louis many times before and I am sure he never thought of our company, or our product, until our little friendly concessionnaire showed flying.

Soon he was in the office, and our officers were especially ready for meeting some special conditions. We got the order, and as about a year's time he had standardized on our machine. He is still very much interested in flying and I don't mention flying to him at all, but his hop thinks I am a great fellow, and he thanks me for the time I gave to the world, and I thank my machine

as the best ever, and for result is very mysterious to my competitor. He probably thinks he has broken.

Let me cite another instance.

The largest user of machines, such as I sold, brought from my competitor the reasons unknown to me as to why he had regularly for years and was turning out and selling all of them. I had to get the customer to play golf with me, to go to the ball game, lunch, or anything—without success.

"You'll break your neck if you don't keep away from those things," he said. I asked him if he had ever lost his job, and he made the statement that leads the story.

At this rate I was home for dinner, and when I was called on that evening, I placed him with his papers as he already did. He looked up and asked if I had got home on schedule the last time. He asked if I flew the plane myself, and a few other of the usual questions about flying. Just a few minutes of that, and I was able to hold his interest long enough to get over a description of one of the most important features of our machine.

Still no orders, and so every call he seemed to capture my factory and see our machine in operation, but he never did. However, every time I called he asked a few questions about flying, generally he would light me on for some accident he had read about.

One evening I was going and old Mr. Tough, our local concessionnaire, announced that he was in St. Louis, had one hour to spare before train time, and would come over and look at our machine. I could guarantee to get him back to the depot in time to catch his train.

It grew dark, and after an hour at the factory, he met the officers of our company and saw that we were a substantial outfit carrying a good product. He had been in St. Louis many times before and I am sure he never thought of our company, or our product, until our little friendly concessionnaire showed flying.

Soon he was in the office, and our officers were especially ready for meeting some special conditions. We got the order, and as about a year's time he had standardized on our machine. He is still very much interested in flying and I don't mention flying to him at all, but his hop thinks I am a great fellow, and he thanks me for the time I gave to the world, and I thank my machine

I had an even a larger plane to take this, and when we got started up and about ready, with the wife and boys all seated, papa come up and said he guessed he would go, too.

Needless to say, they all enjoyed it, and therewith I was not only welcome to his entire family, but also was given a ride off his business.

I take the whole family up frequently and am on the inside track, and another consequence is probably selling his sales manager that if I am invited, that audience is getting a ride-off for keeping from me, or some other all.

Finally the last difference is we are now completely acquainted. The purchase will now explain his needs to me in detail, I can figure very closely on just what he needs to meet the conditions, he gets a product at a very reasonable price, and every one is happy except the competitor who doesn't understand the psychology of that flying business.

There are many cases where the purchase lets me fly him around so much it might almost be considered bribery but any sales manager who ever sold anything himself will appreciate the importance of intimate personal contacts between the two men.

For instance selling a commodity for which an average order is \$100.00 or more will find at a very great advantage if he can get his customer or prospective customer to visit the factory. This is the best way to meet flying. Try to get a passenger to visit your factory. Surety-one out of a hundred will say "I'll come in and see you." Then going the airplane on him. We can have someone meeting, he back to tomorrow evening, an outstanding experience, being the wife and children. Even if he won't go he will remember you when you next call, and if he remembers you after, he will come in.

They will be asking you to come in.

It takes some thought to find the best uses for an airplane in any particular kind of sales promotion work, but any sales manager who has ever put his contacts on an organization, has the opportunity to develop many uses of putting the plane to work. It is for the most effective means of creating personal interest.



Index TO THIS EXHIBIT

Aeronautical Corporation of America	121
Air Mail Airplane Company	120
Airplane Development Corporation	120
American Eagle-Lentz Aircraft Corporation	120
Aviation Aircraft Company	124
Bellanca Aircraft Corporation	125
Beech Aircraft Company	120
Cessna Aircraft Corporation	120
Consolidated Aircraft Corporation	122
Curtiss-Wright-Mell Aircraft Corporation	127
Curtiss-Wright Airplane Company	126
Douglas Aircraft Company, Inc.	129
Fordson Aviation Corporation	127
Gowen, Miller & DeLoach	129
Great Lakes Aircraft Corporation	129
Henderson Aircraft Corporation	127
International Aircraft Corporation	129
Ballard Aeroplane Corporation	129
Bissell Aeroplane and Motor Company, Ltd.	120
E. M. Laird Aeroplane Company	123
Lambert Aircraft Corporation	122
Lockheed Aircraft Corporation	125
Class A Marine Company	122
Northrop Corporation	123
Pioneerfield Aircraft Corporation	120
Wiley Post Aeroplane Corporation	128
Wright Aeroplane, Inc.	122
Wright Aircraft Company	125
Wright-Martin Corporation	124
Wright-Patterson Corporation	122
Stearman Aircraft Corporation	124
Stinson Aircraft Corporation	122
Stolte Aircraft Company	126
Superior-Tomasi Corporation	129
Wiley Flores Best Company	129
Waco Aircraft Company	129
Society National	129

Complete comparative tabulation of dimensions, design characteristics and performance for the plane and engine shown and described in this section and for many others appear on page 126 and the pages that immediately follow it.



THIS is for owners of airplanes, and operators of flying services, and for all those who might and ought to become owners and would do so if the case were properly presented to them, and for all others interested. The best place to display a really good airplane is in the air, but it is convenient from time to time to get them all together in one place for comparison. Hence this exhibit on paper. Turn this leaf, and you will be in the aisle of the show. Turn it and the leaves that follow, and you will pass among the widest range of products — the most efficient and reliable and best-performing and most thoroughly tested aircraft — the best values that any industry in the world has ever been able to display.

BEECH



N-100



Beech Model 100
Overall length 30 ft.
Gross weight 1,000 lb.
Maximum load 1,000 lb.
Span 20 ft. 6 in.
Length 21 ft. 6 in.
Gross weight 1,000 lb.
Maximum load 1,000 lb.



Model 100

BEECHCRAFT cabin implants come out of Wichita as a reminder of that city's pre-eminence as a centre of post-war light-commercial aircraft construction and of the leading part that Walter Beech played in the development of Wichita's aircraft industry.

For three years Mr. Beech has been leading planes under his own name, comprising an appearance for mail and stage and ten more models: remarkable landing gear. The first of the line was flown on Nov. 6, 1932, and new designs and changes in detail have been frequent since that date. Beechcraft come now in four forms: to passengers, to freight, to passengers from the Jacobs 223 to the Cyclone 650 hp.

The structure is of steel throughout, including the wings, and the design shows a general concern for aerodynamic cleanliness and high performance, even in the use of a curved wingbead. When landing gear are not retractable they are fully streamlined and made to serve as a point of anchorage for flying wires to give an improved banking angle. Plans for landing gear retracted and a steeper gliding angle are standard on all models. Stabilizers are fixed and longitudinal trim is maintained by the use of tabs on the elevator surfaces.

The performance data for ten of the models are given in the table. The third photograph, also illustrated, has a 420 hp engine, a 4,500 lb. gross weight, carries a useful load of 1,000 lb., reaches 195 mph.



Model 100



Beech Model 100
Overall length 30 ft.
Gross weight 1,000 lb.
Maximum load 1,000 lb.
Span 20 ft. 6 in.
Length 21 ft. 6 in.
Gross weight 1,000 lb.
Maximum load 1,000 lb.

BELLANCA



Super Viking



Bellanca Super Viking 100 hp.
Overall length 30 ft.
Gross weight 1,500 lb.
Maximum load 1,500 lb.
Span 27 ft. 6 in.
Length 27 ft. 6 in.
Gross weight 1,500 lb.
Maximum load 1,500 lb.



N-7500 Super Viking



Air Express



Bellanca Super Viking
Overall length 30 ft.
Gross weight 1,500 lb.
Maximum load 1,500 lb.
Span 27 ft. 6 in.
Length 27 ft. 6 in.
Gross weight 1,500 lb.
Maximum load 1,500 lb.

BELLANCA monoplanes have been making their reputation with the public at large for a number of years on record-breaking flights, including flights across the Atlantic. A maximum range of 3,000 miles is available for the Super Viking, as still stands. At the same time they have established themselves as a most valuable birds as light transports and for general commercial service as well as for those private owners who want planes as large as those on which the company has specialised.

The Super Viking is designed to the proven formula originated by G. M. Bellanca more than a dozen years ago, a high-wing monoplane with external bracing by means broad enough to make a useful addition to the lift. The American aircraft is a specialized mail pattern, though with three features to a long-distance monoplane and looks on the engine from here shown and with two Wright Cyclones of 715 hp. each and a maximum speed of 190 mph. The wings of the American combine space with open-sided steel-tube steel spars. Wing flaps bring the landing speed of the two-engined model to over 20 mph. in spite of a wing load of over 20 lb. per sq. ft.

The Bellanca Super is of radically different form. A specialized design developed for Major Palamedes to use in his fast Mailplane, not of his remarkable landing gear speed of better than 250 mph. at 9,000 ft. with a new Pratt & Whitney engine giving 350 hp. at that altitude, 3,000 miles range.

CURTISS-WRIGHT



40 ft. 6 in.

31 ft. 6 in.

46 ft. 6 in.

AIRPLANE manufacture under the flag of Curtiss Wright has for six years been divided between two cities, with military production carried on in Buffalo and the civilian market in St. Louis. The commercial designs of the past five years have ranged from two-passenger capacity to twenty and from 45 to 1,400 hp. The range of products now offered to the market is slightly more restricted at the lower end, the result of the present list being the Speeder of three-passenger capacity, 29 ft. span and 175 hp. - here in view is the Speeder with a three-cylinder 100-hp. Wright Whirlwind engine of from 250 to 420 hp. and a top speed ranging in accordance with power from 175 to 185 mph.

The design of the Curtiss-Wright biplane is one

for a number of years past as the company's exclusive from the Condor transport. Through a variety of engine arrangements have been used in the Condor, its intended capacity of fifteen passengers and two pilots, with two Cyclone engines turning up a total of 1,400 hp., a gross weight of 17,500 lb. and a span of 87 ft. The wing loading is far below the usual transport practice—withstanding the maximum speed of 190 mph. at 8,000 ft. Condor wings are fabric covered, but the interior structure is all-metal, a welded steel spine and aluminum ribs, fastings of vital tubing.

Completely new in 1935 is the four-passenger aeroplane with Whirlwind engine, designed primarily to serve the sportsman and tourist for whom, instead of the center of gravity and nose wheel at the nose instead of the tail.



CONDOR

FAIRCHILD



24H



WALKER 24H-2



WALKER 24H-2C-2



WALKER 24H-2C-2

Since inaugurating its present general line of production the Fairchild company has given primary attention to the needs of the private or industrial user who does his flying alone or with a single companion or two at most and stomachs for that market continue to take a leading place in the Fairchild line. They came in both open and closed forms, the former with a 100-hp. Wright Whirlwind in standard power plant, the latter which is built in either two- or three-passenger seating arrangement with a Fairchild Ranger engine or the Warner Super Scarab of 140. The demand for open and cabin types has been over enough to warrant the introduction of a third variation this year during the past season.

The open model with its four-place power has approximately 20 mph. less speed than the cabin type and about 2,000 ft. less ceiling and a third less range. The overall dimensions of the two nose sections are very much the same, the three-cylinder having span 3 ft. more span and 10 per cent more wing area. The construction is the conventional combination of welded wing and tailplane and fuselage. Seating in the cabin models is by two in front and two in the rear. The third seat, while there is one, is in the rear.

Other Fairchild models, new in the present year, are the four-passenger low-wing monoplane with a top speed of 168 mph. from a 225-hp. Jacobs engine and a remarkable landing gear, a long-distance, moderate-speed, high-engine. Freight, originally developed for the Army and a single-winged amphibian building for Pan American.

STINSON



STINSON TRAINER



AIRLAYER

Stinson Model 105
110 hp.
Max. weight 21,100 lbs.
Range 500 mls.
Empty weight 13,100 lbs.

DURING more than ten years in which Stinson has been building four-passenger cabin monoplanes, there has been no great or sudden modification in the type, but a steady evolution. Of the various models several hundred are now in service. The latest of these, the Model 105, is predominately having a high-wing monoplane fuselage, leading edge of the full tail-driven type, and notable for its simplicity. The structure resembles that of most other light commercial planes of American manufacture in employing a welded steel tube fuselage, but it introduces an individual and somewhat unusual feature in combining spruce spars with light alloy ribs. Wing flaps are provided.

The Stinson company has been as faithful to the in-line engine as in the medium-sized monoplane for private ownership. The 1935 Airlayer with three Lycoming engines rated at 260 hp each, offers an excellent model for the private passenger. It features having a rounded steel spar instead of wooden spar. The leading gear is retractable by electric power. Payload allows for eight passengers and 500 lb baggage or mail.

The most novel item on the lot is an open cockpit parasol-type training plane with Lycoming engine, a 120-hp, four-cylinder, and 405-mile range. The general type of structure is similar to that of the Airlayer, and the wing is of almost the same size.

DOUGLAS



DALPHIN

Douglas DC-2
260 hp.
Span 67 ft.
Length 36 ft.
Height 10 ft.
Empty weight 10,000 lbs.
Max. weight 16,000 lbs.
Range 1,000 mls.

THE LEADER of the Douglas showings, by far the most numbers produced or of reputation gained, is the twin-engined transport DC-2, of which almost 100 are now traveling the airways of the world. Its fourteen-passenger sound-cooled cabin and its performance are known throughout the world. The structure, like that of most recent transports, and twin-engine planes, is built along conventional lines excepted skinning. The material is Alitalon or French cottonwood, providing artificial protective coating. Engines are Wright Cyclones or Pratt & Whitney Hornets.

The competitor also is the Douglas DC-1 that uses the wings and fuselage structure and with a plywood skin. It is available either as flying boat or straight amphibian, with a 600 lb difference in empty weight between the two and a corresponding change in useful load.

KELLETT



THE KELLETT aircraft has recently shrunk its wings, taking new direct control horns. Rotor pulley has been eliminated, more external weight eliminated, improved performance and improved handling result. With a folding nose, the machine needs little room for storage.

KINNER



KINNER has, for many years, built both engines and airplanes under a single manufacturing organization. The planes themselves span over a wide range, four models being offered. In the sports class the Spitter is two places, one with 100 hp. engine. The other with 125 hp. twin cylinder. The Sporting, 1125 hp. is available. Cabin types include the Playboy, 1160 hp. 1, and the Caddy, a four place ship with 400 hp. Performance range from a top of 124 m.p.h. with the 100-hp. Spitter up to 165 m.p.h. for the Playboy. The cabin Neurotette has a 625 m.p.h. cruising range, rather more than an average figure for that category. All models, even the small ones, are fitted with tail control on the elevators for longer duration flight.

BOEING



BOEING, twin engined transport monoplane, with nearly 10 years of extensive service in the airways, is behind it is the Boeing 247. Designed as the 247S with 910 hp. Wasp engines, performance, four or five engines, has been increased, passenger comfort improved, cruising speed raised nearly 20 m.p.h.

WACO



WACO



FOLLOWING almost a dozen pioneering years of building open biplanes, the Waco Aircraft Company launched out into four-passenger cabin biplanes, a ship that has had wide acceptance. The 1933 line is standard, with models in three engine sizes. Two are standard aircraft for the aeronautical pleasure of a Conventional 210 hp. engine, or a Jacobs 235. The third, with 10 per cent more wing area and some 6 miles more speed, 114 m.p.h. top, moves a 250 hp. Wright and has a cruising range of 560 miles, the other models running about 300.

The custom model cabin, new this year, appears with the same arrangement of engine and substantially the same wing area, but about 12 to 15 miles more speed. The gross weight of all the cabin types is around 4000 lbs. and all use the standard Waco standard three-blade propeller.

For those who prefer to fly on the quiet, there is the Model F, series with a choice of Conventional or Jacobs engines. The range is of the same order as the standard rates models, with speed and ceiling higher by about 5 miles and 1200 ft. respectively. The last item on the list is a two-passenger biplane with removable cockpit inclosure, the Model D, with a 400 hp. Pratt & Whitney Wasp Jr. engine, pulling it along at 105 m.p.h. and up to 21,000 ft. altitude. The maximum life of that of all the other Wacos is of course in the wings and vented chrome molybdenum steel tubing in the fuel tank.

MARTIN



Dove Transport



SPECIALISTS in large transports, the Martin Company has produced the Lingot set in a four-engined P.D.W. twin row transport. Biggest American transport, it bears readiness to carry passengers across the Pacific. First American design to substitute new wings for the usual wings for flight.



LAMBERT



90-90A

PIONEER among fast cabin transports, the Monocoupe is now available in the plane. Models 925 and P-145 (both Warner power), as in the current production, Model 90, with Lambert R-266 engine. De Luxe 90A offers extra performance from improved cooling and adoption of racing engine. Paps

NORTHROP



10A



IN WIDESPREAD transport and industrial use, the current Northrops exhibit the distinctive metal monocoque fuselage and stressed-skin multi-spine wing construction. In unseated landing gear. Among the first to adopt wing flaps, Northrops introduce them on all production models.

CONSOLIDATED



PT-11C

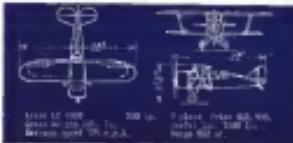


PT-11C twin engines, backed by many years of test flying, teach that metal fuselages can give to military planes are fitted with 120 hp. or 160 hp. Kestrel engines respectively. Maximum speeds of 100 by 10 mph. The PT-11C, a larger and faster two-place trainer set here shows a development. 132 mph. top speed from a 250 hp. Whirlwind.

LAIRD



MODEL LC-1000



SINCE the appearance of the first Laird Seafair, well after the War, the name has placed a constant mark in the aeronautical industry. In engine power, the present Laird 20-2000 is a specialized machine, not in small production for specialized needs. The Laird 20-2000 is a two-passenger cabin model with a top speed of 200 mph., fast to cut down the landing speed and a shoulder monoplane fuselage—the last a somewhat unusual feature in a machine of this size. The open cockpit, both two and three-passenger also dispense from the necessary standards in structure in having the fuselage framing of light alloy tubing. The two-passenger machine with a 200 hp. engine does 190 mph. at 5,000 ft. Climbing cells are generous. 850 miles for the 200 hp. machine. 600 to 700 miles for open models.

AIRPLANE DEVELOPMENT

AVIATION
1936 / 1937

OF THE design-oriented line of 14,000-cubic-inch transports in lower wings, the Vultee V-11 is the first to design features to contribute to the species of high-performance aviation during the last ten years. Steering features are control cables, sound-decelerating simplicity and directness of the reversing gear.



Vultee V-11



SEVERSKY

A HIGH performance, multi-purpose type is offered in the SEV-100. All-metal construction includes full monocoque fuselage, multiple fairings, wing with stressed dorsal skin, flexible fabric over type empennage, gear with retractable front, with landing wheels preparing through dampers in the rear bays.



SEV-100



STEARMAN

ONLY military model offered is a standard tail, single bay biplane for half Cleopatra lines and 420 hp. Pratt & Whitney, or a high altitude speed. Notable feature is a center section with triced landing gear with retractable wheels. Forward cockpit covered gives higher performance with weight added.



Model 40

AVIATION
1936 / 1937

RYAN



DISTINGUISHED by departure from the conventional in usage of materials, the new Ryan 3-10 combines a streamline all-metal monocoque fuselage with fabric-covered wings. Equipped with spacious open cockpit. Powered by Menasco, the 3-10 offers the private aviator advantages for low power.



LOCKHEED



Model 10A



10A



10A

IN THE YEARS when the use of monocoque structure, cantilever wings, and a smooth elliptical fuselage section were almost unique, the name of Lockheed came to symbolize the type. Sight-engined Vega, Orion and Altair continue in Lockheed aircraft, all going speeds in the 230 mph region, but the special concentration now is in the transport field, for which the Electra was designed and the Electra A, B, C, D, E, and F, a series of aircraft with either and without American engines. With electrically operated retractable landing gear, to help at one end of the speed range and flaps to help at the other, the Electra goes in performance with but 80 hp per passenger. As in most other aircraft transports, the greatest success is in Allied monoplane transports. These are Pratt & Whitney Wasp Jr. or ultimately Whirlwind.

SIKORSKY



MODEL S-43



TAYLOR



THREE versions of the Cub are offered, all substantially alike in structure and form, but differing in power plant. Standard at 40 hp—maximum load 550 lbs. Aeromotors at 40 hp—maximum load 600 lbs. but water-cooled available at an extra, structurally conventional

CUNNINGHAM-HALL



ALL METAL construction with steel wing spars and a closed monocoque fuselage and a new type of variable-incidence wing to cut the maximum speed much more than a plain flap would allow are the most distinctive features of the new Cunningham-Hall product. The landing gear is semi-retractable.

HAMMOND



WHENEVER the late D. C. design competition, the Hammond Y is a thoroughly unconventional type with unusual performance possibilities predicted for it. Sole key side ruling for the best lead angle of vision and three whirled landing gear are attractive features for the private owner.

AERONAUTICAL CORPORATION



WITH more than 200 machines of the same general class built in the last few years, the Aeromotors has a longer record of continuous production than any other light plane. It is available either as a landplane or seaplane. Current production models are powered with a two-cylinder Aeromotors engine of 40 hp.

PORTERFIELD



Model 1-14



THE Porterfield two-place tandem cabin monoplane is designed to take either the 60 hp. Velie or the 70 hp. LeBlond engine. With the latter it will cruise at 100 mph. for 200 miles. Large windows and a transparent panel in the wing provide good vision for pilot.



BEARWIN



Model 1000-I

IN 1935 the Spindtine (designed) was offered the junior open-gauge open cockpit. With optional water-cooled monoplane powered with their cylinder 50 hp. Aeromot engine. A power machine (Model 1000-I) is a cabin seat for two with LeBlond engine of 70 hp. Construction and materials are completely

WILEY POST



Model 1-14



OUT of all past efforts to apply auto radial engines to aircraft, the Wiley Post A is the sole commercial offering to day. He modified a Ford engine. All 1000-I is the only liquid-cooled power plant now available for private use. A general belief of conventional construction.

AVIATION
April, 1935AVIATION
April, 1935

SECURITY-NATIONAL Aircraft Corporation offers the two-place Spiritster powered with a Security 8-5 engine of 120 hp. Seagull arrangement is also available.



BUILT ORIGINALLY for the McAllisterian Race, the Model QED by Granville, Miller and DeLoach is available for high performance sports use.



IN THE LIGHT PLANE category, American Eagle Lincoln Aircraft Company has the 8-52 Eagle, for two people, powered with the 45 hp. three-cylinder Seabury.



AIRCRAFT MECHANICS, Inc., offers two versions of the Flyabout and Continental one Seabury powered. The Model AAF biplane (Whirwind) is also available.



FOR FIFTEEN YEARS Bearwin designs have been built around the broad arched type fuselage. Latest model is all metal powered with two PMA Hornets.



THE FAMILIAR Great Lakes Trainer now appears in a single model, the 27-IA powered with an eight-cylinder Cirrus two-cylinder engine of 100 hp.



OF CONVENTIONAL TYPE and construction, the 8-52 Kite Hawk, three-place biplane powered with a 8-5 Kaver is presented by the Viking Flying Boat Company.



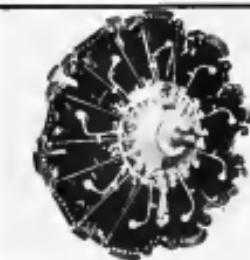
PIONEER DESIGNER for the bone biplane, International Aircraft Corporation also offers three racing-built models powered with Hawks and Continental engines.



CESSNA comes to the 1935 market with a sleek cut cantilever monoplane for four powered with a Warner 115-hp. Super Scarab. Radio is standard equipment.

Representative American Engines

The variety of the engines on display in these pages naturally depends on the engine builders, for no skeptic in bankruptcy there is an engine to go into it. The designer or the private purchaser with ideas of his own may find himself presented with difficulties concerning just a dozen different cylinder arrangements and power ranges from a gasoline motor-twin to a gasoline tetracylinder. A representative, but only a fractional, selection of the engineering ability's 1939 offerings are displayed upon these pages. An extremely greater number and variety are covered in detail by the tabulation on pages 168 and 261.



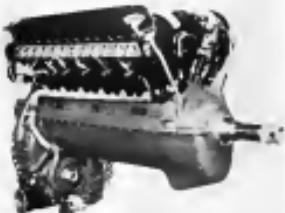
Cyclone (Pratt & Whitney Aircraft Company)



Wright R-1820 (Pratt & Whitney Aircraft Company)



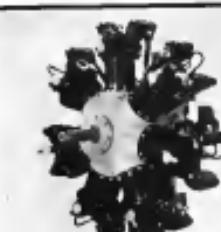
Pratt & Whitney R-1340 (Pratt & Whitney Aircraft Company)



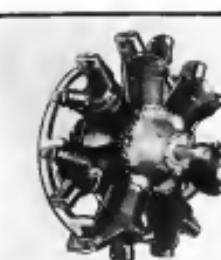
Curtiss Super Cyclone (Wright Aircraft Corporation)



Jacobs L-20 (Jacobs Aircraft Engine Company)



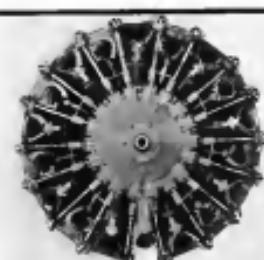
Pratt & Whitney R-985 (Pratt & Whitney Aircraft Company)



Pratt & Whitney R-1340 (Pratt & Whitney Aircraft Company)



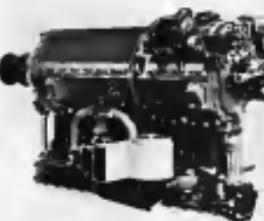
Pratt & Whitney R-1830 (Pratt & Whitney Aircraft Company)



Pratt & Whitney R-1830 (Pratt & Whitney Aircraft Company)



Pratt & Whitney R-1830 (Pratt & Whitney Aircraft Company)



Pratt & Whitney R-1830 (Pratt & Whitney Aircraft Company)

Accessories for the Airplane Owner

The tank engineer leaves the factory ready to go into service across country, but the manufacturer cannot *guarantee* all of his purchaser's special needs, interests, and plans. His plane-owner will have to *invent* these things himself by buying necessary equipment, and in most cases he cannot enter the market for raw material and accessories as quickly as he gets acquainted with his new property and the full possible range of its usefulness. It might be the business of the engine distributor to advise him on what he *really* needs to get the most use and the most *fun* out of his ship, and cautions him to spend his money to best advantage. The scope of choice, very wide, appears in part from these pages.



Contingent-risk payoffs are a substitute for expected payoffs in providing cash-flow variability performance and risk-off



The industrial sector often has strict rules for its social norms.



A rapidly growing list of patients and material culture are available to radio receive at the University of Michigan as shown in Table 1.



Waste oil-derived biodiesel production may be approached by an early-stage model involving fuel blending and performance-testing data.



Ruths and Ruths Companies

Wendell April Comes On
Last Wednesday Sat
8:45 P.M.
Monday & Friday Sat
Western Electric Co
Western Side St

Book Reviews

General Book Review

Emilia Azevedo de Melo Du-
blon, Arquiteta, 1945.

Environ Monit Assess

1000

Editorial: Annual Survey of Primary Schools 2010

Hypothetical Argument

Reverend Almon M. E. Coffey
Mt. Zion C. of C. (Pastor)
Jesus, An Open Secret (Bookstore)
Kirkland, Franklin & Belmont
Wenatchee
Gospel Tabernacle (Meeting House)
Mt. Zion C. of C. (Meeting House)
Kirkland, Franklin & Belmont
Jesus, An Open Secret (Bookstore)
Kirkland, Franklin & Belmont
Jesus, An Open Secret (Bookstore)
Kirkland, Franklin & Belmont
Jesus, An Open Secret (Bookstore)
Kirkland, Franklin & Belmont
Jesus, An Open Secret (Bookstore)

EDITORIALS

AVIATION

EDWARD P. WALKER, Edw.

Supplementary for 1935

IT IS VERY BRIEF and simple. It is addressed to all individuals, groups, dignitaries, operators of government, corporations, and educational institutions who may feel moved towards a pre-publication of their own achievements. To them, individually and collectively, goes out the fervent petition in Green Pasture-sque phrase: "Stop pressurize cracked for a while, and let us find our own way to the Promised Land without shitting the ground under our feet so much."

It seems to be a law of nature that every now and then aviation must find its wings hobbled in a alleged star that turns out to be of the falling variety and plings itself into the ground with an un-rending and heart-rending thump. If we had to judge it by proliferation and popular media progress since 1927 would look like the track chart of a Mexican jumping bean. There was the OX5-engined-airplane-in-every-garage mania of 1928. There was the glider mania of 1930, when a million high school football players were so by synthesized into glider pilots and every American huloke was to blazon forth with the rapiad traits of the Wasserkuppe. There was the light plane mania of 1931, when the glider that had flopped so ingloriously in the previous mania found itself equipped with an engine and prepared to go forth and conquer the skies of 20,000 Americans. There was something wrong with that picture, too. After that there ensued a brief space to let the adulators at those astounding phenomena catch their breaths, and then suddenly began a new series of chain-fighting manias, of which the most spectacular and popularly appealing was the never-financed-dollar airplane of world memory.

Well, what we mean is, we've had enough of it. All this time, while the jumping bean of imaginative specula-

tions has been providing entertainment for the eye and ear, the responsible aircraft industry, like the humble plodding tortoise of the fable, has been moving slowly but certainly across country. When obstacles to progress show up, the nimble-working sector tries to outflank them by leaping 6 ft. in the air, letting out a warwhoop, and making a right angle turn. The manufacturers that are really trying to make aviation a business, on the other hand, have learned by harsh experience to prefer the curious but commendable course of finding out just what and where the obstructions are and then proceeding either to remove or to sidestep it by taking thought and using research.

SO THEY have made progress. So they have a product to offer which has undergone steady improvement in quality and in value estimated for money received and which today, as it is displayed elsewhere in these pages, can be regarded with satisfied pride. So they have stablyd ground ground in connecting business men and sportsmen alike to the ownership of aircraft by showing them what aircraft had to offer.

So it is that progress will continue, that the conversion of new owners will accelerate, and that the market will grow if given even half a chance. By way of giving it half a chance, we suggest that the provision of public assistance can be left to General Johnson, Senator Long, and Father Coughlin, and that aviation may content itself with the more private rôle of providing public service. To remember that "epoch-making" is a high-priest word and to be used sparingly will deprive us of the shells of recently-promised technical revolution, but it will give us a chance to keep moving in a straight line towards our goal.

NEWS
of the
MONTH

Second Pacific Derby?

SETTING off some rumors throughout the aeronautical industry than any comparable product of recent years, a recently-published *Los Angeles Times* article has brought up the subject of a second Japan to Honolulu race obvious were the project's end purposes, the full intent could easily be the relationship of such a flight to the future of Pan American Airways' airplane service to the Orient. All predictions were fairly apt to be originated from Washington or Hammonia.

This could easily be definitely learned.

The plane out the DC-1 represents per-

sonal and transport experience of California . . . Pan American has been in the Pacific with new and materials for its own construction . . . Martin Flying Boat number gross 51,000 lbs . . . Douglas Aircraft Company General Faculty extends and maintains an active research center . . . Pan American has through sale and elsewhere from Los Angeles to Cleveland.

* * * * * Many aeronautic organizations have been instrumental in the development of aircraft to examine rigid flying structures . . . House appropriations committee approves expenditure of \$100,000 for Hammonia air base.

* * * * * Congress pushes bills for larger air forces, more Air Corps bases. Title of aviation bill has been before Congress.

* * * * * Hitler formally ad- mits existence of German Air Force . . . Europe plans air armament increases . . . Germany plans Atlantic service with U-125.

* * * * * North American 22-732-205 contract to Curtis Aeroplane & Motor Company for 120 planes . . . North American Aircraft and Engineering Company, Inc., during 1934 at \$1,061,273 . . . Kuhlin, Look & Company to receive reward money, holder of Transcontinental and Western Air, Inc., stock . . . Consolidated sys- tem reports net profit of \$6,568 for 1934.

As arrival at San Diego near day when crossing the Gulf of Mexico flying westward to Mexico's west coast and making an overnight stop at Acapulco, from St. Louis that the *Mexico 100* had incontestably passed in full lead (\$14,000 in gross) series.

Aviation reactions caused by the *Baron's* adoption of the "aviary" de- long method varied from OJ interpreting the proposed flight as pro-Pan American since it would demonstrate

over the new route the effectiveness of present navigation methods, (2) had us in a "yankified" session, especially pertaining to potential Pan American competition because it implied serious opposition for the use of airplanes on transoceanic routes, (3) guessing it a preliminary to a specific project or which might figure some of the following: (a) *Japan* Roosevelt, (b) *Japan* V, (c) *Japan* Atlantic, (d) *Baron* boat, (e) Capt. Bergnerberg, retired, (d) almost any air transport organization known to the industry, (e) even *Amatong Seafarers*. A few held it simply a desire to render more effective planned demonstrations of blind flying technique due to TWA transoceanic route for which the plane had originally been issued the *Star Corps* personnel issued to the *Baron*.

More air mail line

Meanwhile most transport operators were infinitely more concerned with what measure of relief could be forthcoming from the reorganized Congress. As shown in the accompanying table, and in the one published in this department last month, chart hope was cast with the bill introduced into the House by Representative Fred of New York, chairman of the House Post Office Committee. Specifically enacting the C.R.E. to be enacted at the same time as maximum rates (40 cents a mile in extra postage rates), raising the present primary-secondary rate requirements ruling that henceforth no transport operator shall be allowed to increase or raise the frequency of any passenger or express service emergency rate with respect to any particular mail or message, the bill, much-maligned emanated from the Post Office Committee early in March, passed the House March 25 after agreed political debate but without further angle changes.

To span the interval between Feb. 28 and the enactment of the reorganized legislation, Postmaster General A. Felt extended contracts on some routes that would have otherwise expired March 1 for periods from six to twelve weeks. He has continued his stand, however, and has supported it by the Air Mail Division, but present legislation does not empower the Postmaster General to revise rates upward.

Concerning the outcome generally after a meeting of aeronautical executives held in Washington during early March a committee of four, C. R. Smith (president American), W. A.

next year compared with a maximum preceding annual allotment of 45,000.

War Over Europe

Alread, the spectacular developments in the German rearmament situation which marked the month had widely important astronomical effects. The most important of continuing work in extending air bases over Berlin was undoubtedly a prime factor in forcing first an ultimatum by Hitler that Germany did possess a military air force, later the frank indication of the intentions of the British Air Staff Federation to the official British Ambassador to Berlin, General Frankland, that Berlin and Germany alone had undertaken to provide exercises over London by the Royal Air Force, over Paris by French Army Squadrons, was carried out to emphasize the city's vulnerability. For the raid, made at night, Berlin, underwent the most thoroughgoing blackout any city has ever experienced. A lighted stadium qualified for targets.

Meanwhile from London and Paris, France and Russia came further discussions of the annual air defense plan first proposed by France and Great Britain early in February; prints agreed in general, new increases in aerial procurement plans. At Geneva, after a fifteen year absence came the now

Baron Faurevemont Hervé, 66, who for many years played a leading part in the formation and management of aerial quantification and transport companies died March 7 in New York City. Directly after the World War he became a pioneer and assistant to the president of the Wright-Martin Aircraft Company, later chairman of the board of directors of the Wright Aeronautical Corporation. In 1919 he was instrumental in effecting the merging of the Curtiss, Wright, and Martin Companies and their franchises with Wright Aeronautical Corporation, and became chairman of the board of Curtiss Wright Corporation, holding the position at the time of his death. Mr. Hervé was also vice-chairman of the aeronautics committee of the American Chamber of Commerce, Pan American Airways, Transoceanic Air Transport, and the Benrus Aviation Corporation. As chairman of the board of National Aviation Corporation he actively sponsored winning service to Long Island of Martin's Vickers from the Wall Street largest last year, being himself one of the first business men to stimulate to his Wall Street office by airplane



TEETHERED BUT UNTAMED
The Los Angeles air base usually means a peaceful existence for the 1,000-man crew. But here a giant airship is tethered to a 40-ton steel ring it floated the last month, and underneath

balloons declared that the only practical formula that could be used to distinguish between military and civil aeronautics was that military units are those which have been created, or organized, as military organizations. Civil aircraft are those without such appendages.

Sober reality as all the confusion seemed to consolate step up of military aircraft production throughout Europe to a scale unparalleled since the Armistice.

Most painful was the news that Jean de la Gouze sailing for home after keeping a mission to study American industry and transport, had once more demonstrated an impairment of the surgeon that time a fracture while performing a short vertical ascent from a standing start. To the rear hub is added a further mechanism controlling the angle of incidence of the blades. So far as is known, the blades are run by hydraulic power, although the maximum speed of rotation in normal flight is the 3000 revs per min. of its engine, twice the 1500 revs per min. prevailing for some months past.

Government contracts totaling more than \$25,000 have been received by the Curtiss-Wright Corporation of Detroit, N. Y. The largest is for 40 special light weight transports to be used in various types of aerial surveys.

A P.W.A. grant of \$57,000 for improvements at Newark airport has been increased to \$46,180 to enable the city to install a full radio station, telephone extensions, electrical service alterations, and a radio tower.

The Polden Aircraft Corporation of Kansas City has moved to larger quarters at 2520 Mayfield, Trailways. With approximately 100,000 sq. ft. of floor space the new factory provides for much increased Polden production.

The Polden Airplane Factory of Amsterdam which holds European contracts for the Douglas DC-3 has received an order for two transports of that type from L.D.T., Polish airline operating company.

Recent plane sales of interest: A Bel-

gium 5000 de la Gouze sailing for home after keeping a mission to study American industry and transport, had once more demonstrated an impairment of the surgeon that time a fracture while performing a short vertical ascent from a standing start. To the rear hub is added a further mechanism controlling the angle of incidence of the blades. So far as is known, the blades are run by hydraulic power, although the maximum speed of rotation in normal flight is the 3000 revs per min. of its engine, twice the 1500 revs per min. prevailing for some months past.

Sober reality as all the confusion seemed to consolate step up of military aircraft production throughout Europe to a scale unparalleled since the Armistice.

Most painful was the news that Jean de la Gouze sailing for home after keeping a mission to study American industry and transport, had once more demonstrated an impairment of the surgeon that time a fracture while performing a short vertical ascent from a standing start. To the rear hub is added a further mechanism controlling the angle of incidence of the blades. So far as is known, the blades are run by hydraulic power, although the maximum speed of rotation in normal flight is the 3000 revs per min. of its engine, twice the 1500 revs per min. prevailing for some months past.

Government contracts totaling more than \$25,000 have been received by the Curtiss-Wright Corporation of Detroit, N. Y. The largest is for 40 special light weight transports to be used in various types of aerial surveys.

A P.W.A. grant of \$57,000 for improvements at Newark airport has been increased to \$46,180 to enable the city to install a full radio station, telephone extensions, electrical service alterations, and a radio tower.

The Polden Aircraft Corporation of Kansas City has moved to larger quarters at 2520 Mayfield, Trailways. With approximately 100,000 sq. ft. of floor space the new factory provides for much increased Polden production.

The Polden Airplane Factory of Amsterdam which holds European contracts for the Douglas DC-3 has received an order for two transports of that type from L.D.T., Polish airline operating company.

Recent plane sales of interest: A Bel-

AVIATION April, 1939

AVIATION

April, 1939

Long distance to Milwaukee Air Service is to be used principally in carrying visitors out of the Great Bear Lake region. A Douglas Dolphin and gliders to the Standard Oil Company of New Jersey. One Pan American Flyer to Brazil, a second to a customer in Mexico City.

Financial reports

Describing a non-loss claim operating during 1938 of \$1,061,031, the annual report of North American Aviation, Inc. (Eastern Division) and General Aviation Corporation, Columbus, Ohio, said public opinion recently revealed that the only profit during 1938 resulted from the sale of properties. The latter, however, reached \$1,266,286, changed the final result to a surplus of \$206,211 for the year.

In a statement accompanying the report, stockholders signed by J. H. Knobell, chairman president of Eastern, the chairman of the board, it was stated that "conditions are not such in the air transport industry as to encourage your company to continue indefinitely in the air transport business unless more reasonable legislation is obtained, not only ameliorating the present restrictions imposed by the Air Mail Act of 1934 but also offering reasonable encouragement for the natural growth of this business."

The report showed operating revenues of \$1,528,862 against an operating net of \$2,028,862. With depreciation, initial expenses and other charges, total costs of the company came to \$3,078,914. This figure was the result of a \$1,000,000 income income credits brought the net operating loss to \$1,000,000.

Air Transport, Inc. reported net assets value based on cash and market value of securities owned amounted to \$1,028,262 on Dec. 31 last, compared with \$1,242,416 on the same date in the previous year. Total assets, \$2,165,000, of Transoceanic Air Transport, Inc., a Wisconsin Air Transport, Inc., held by the Pittsburgh Aviation Interest Corporation have been acquired by Kahn, Ladd &

Co., making the latter second largest holder of this stock. Largest single stock, \$3,000, is held by General Motors Corporation, third largest, \$2,000,000 by the Ford Motor Company, fourth largest, Kahn, Ladd & Co. are holders. Total outstanding shares are 623,823 of which 379,544 were recently distributed to its stockholders by North American, plane.

The Consolidated Aircraft Corporation of Buffalo reported a net loss of \$1,500,000 for the year ended Dec. 31, 1938, and to a lesser extent than I sent a share. In the previous year the company had reported a net loss of \$9,125

Net sales during 1938 totaled \$1,532,200 against \$2,374,862 in 1937, a drop attributed largely to a 57 day strike in the spring of the year. Looking forward to the year 1939, the company expects to sell 1939 with a backlog of \$4,930,000 in unfulfilled orders, more than the total sales for the previous year. The company's income account follows: Cost of products sold before depreciation, \$1,039,859, gross profit before depreciation \$214,186, total operating income, \$806,203, net income before depreciation and taxes, \$56,114, total taxes net depreciation provision \$10,369, net income, \$46,745.



SECOND LARGEST

Being built during the year is France's second transatlantic biplane, the Lioré et Olivier 6000, which will fly to Africa in 1939. The 6000 is 40 ft. 6 in. long and has a 60 ft. 10 in. wingspan. It will carry 10 passengers from Marseille to Algiers in seven hours. Built by Lioré and Olivier.

What's Around That Corner?

May do them. In the meantime air transport will have to limp along with the U.C.C.

Military and naval appropriations, however, are increasing, substantially as presented to the budget. A new Air Corps authorization act is likely to pass the Congress, probably providing somewhat more than the total of 2,250 planes recommended by the Baker Board. Privatization legislation, if there are any, will probably serve to assist defense and naval interests against the Secretary-General's present purchasing policies.

Projects in the field are for a somewhat slow start of the selling season for private aircraft, followed by a rapid pick up to the best level in the year. The 1939 season, beginning in June and July, ought to be well ahead of the same month a year ago. Sales of transports, though somewhat below last year, should exceed any other year since 1929.

FLYING SERVICES and SCHOOLS

TO judge the essays submitted in the 5th annual W. E. Boeing Scholarship Competition, a committee of 20 members of the Boeing Staff, on April 5 and 6. Its members are, Dr. Baldwin M. Woods, dean of the University of California; William Soto of Soto Engineering Laboratories, Dearborn, Michigan; Professor John Abramson, head of Aeronautical Engineering at the University of Massachusetts; Dr. Frank A. Bunn, Bell & Howell, head of aeronautical engineering at the Carnegie Institute of Technology. The committee will also serve as judges of essays submitted for the James W. E. Boeing Scholarship being offered this year for the first time to high school seniors of the Pacific Coast states.

The Board of Governors of the National Aeronautic Association has approved a resolution to be sent to state governors pointing out that the taxation of aviation graduate places an undue burden upon the industry, and requesting the governors of the states not encouraging aviation graduates to take the necessary executive or legislative actions to effect the exemption.

Ninety California aviators attended the NAA meeting at Fresno March 5-6 to discuss aviation bills now before the state legislature. The meeting appointed a committee of three for the purpose of formulating a representation to the state legislature. Leader within the state Dudley Steele of the Redfield Oil Company, was appointed chairman, S. S. Chidester of Standard Oil Company, and J. W. Miller of Western Air Express, being the other members.

Members of the Society of America have undertaken a campaign to raise money in order to take advantage of the offer of the Rhône Alpes Association to match any amount up to \$1,000 that the Society can obtain for prizes at the 5th annual meet to be held at Rheims from June 29 to July 14.

A new glider club was recently organized by students of the Shrine Sun Aircraft School at Philadelphia. A Canasta glider has been purchased and instruction will be in charge of Nicholas Robie who has had considerable gliding experience. Officers of the club are, S. Coker, president;

Thomas Johnson, vice-president; Nicholas Robie, treasurer and H. Schmidman, secretary.

George W. Orr, president of Bucyrus Field, Muncie, New York, has been elected treasurer of the Industrial Aviation Operators of the United States, succeeding Howard A. Aker, president of Waco Sales of New York. Oliver C. Parks was reelected president of the Bucyrus Field, Ohio, vice-president, and Louis R. French, secretary. Casy Jones, president of the Casy Jones School of Aeronautics, Newark, N. J., Ray Brown and George Orr were appointed to permanent places in a new office working team for the association.

Russell Moore, for the past four years operator of Moore Flying Service at Fort McRae, Okla., is now in charge of the Dayton, O., Municipal Airport at Vandalia, succeeding Howard Hayes. Mr. Moore intends to expand his two city stations and Great Bend, Kan., for night dye-instrumentation, will also teach radio communications and instrument flying.

Ray F. Whisman, vice-president of the Consolidated Aircraft Corporation, is the new president of the Auto Club of Florida. Other officers elected by the club at a recent meeting are Howard H. Ross, vice-president; Ralph S. Dugay, secretary, Dr. Ray L. Scott,

treasurer, and Raymond S. McNamee, director. The club, which is one of the oldest flying clubs in the United States, having been incorporated in 1908. Among its 290 members are most of the pilots in the city, many people important in the life of the community.

Lady May, British pilot of many years' experience and founder a member of the Honourable Society of the Independent Aviation Operators of the United States, succeeded Howard Aker, president of Waco Sales of New York. Oliver C. Parks was reelected president of the Bucyrus Field, Ohio, vice-president, and Louis R. French, secretary. Casy Jones, president of the Casy Jones School of Aeronautics, Newark, N. J., Ray Brown and George Orr were appointed to permanent places in a new office working team for the association.

Delegates to the second convention of the Canadian Flying Clubs Association met at Montreal March 6. The association comprises 22 clubs throughout the country, N. S., to Vancouver. B. C., with an aggregate membership of approximately 2,500. According to a statement, the average annual flying activity is estimated at per capita 100 hours, with weather flying hours totaling 10,000 as compared with 9,900 in 1937. Licenses issued in 1938 included 134 private and 21 commercial certificates of competency with 163 private and 36 commercial certificates in 1937.

Major General J. H. Macmillan, Commissioner of the Royal Canadian Mounted Police, was elected honorary president. Other officers for the coming year are: B. J. E. Nelson of Halifax, president; L. H. Smith Hamilton, first vice-president; R. Marion, man-at-arms; G. H. P. Crabb, Weyburn; A. H. S. Russell, Toronto; H. H. Sturrock, Fort William; J. A. Sully, Winnipeg.



A FULL ENROLLMENT

In the next report from the Glider Flying School of America in Newark, N. J., students in the day school will in the winter receive training as aviation mechanics or as aeronautical engineers for the sports field and will be used as a test by the school's authorities.

AVIATION PEOPLE

On March 29, THOMAS A. MEEHAN was elected chairman of the board of Curtiss Wright Corporation, and Peter St. Hilaire P. Heery, Mr. Morgan, who has been president of Curtiss-Wright for four years, was succeeded by GUY H. VANDERKAM, president of Wright Aerocarrier Corporation, who will also remain president of that corporation. Mr. Vanderkam formerly first concession was with the 1936 U.S. Olympic team. The Wright-Martin Aerocarrier Corporation, becoming独立 manager for both the New Brunswick and Long Island factories. After the War Mr. Vanderkam became vice-president and general manager of Van Noyk Metal Company, Monroe, N. Y., later president and general manager of Standard Steel & Hardware Company, Indianapolis. Before from the Army in 1925, he became vice-president and general manager of Wright Aeronautical Corporation, succeeded Charles L. Lawrence as president upon the merger of the Curtiss and Wright groups in 1929.

Officers of Massachusetts Aeronautical Association for the coming year will be FRANCIS H. REEDILL, reelected president; GILBERT L. MARTIN, Edward S. WILSON, SHERMAN M. FARNED, vice-president; JOHN M. REEDILL, treasurer; ROBERT J. BARKER, vice-president; SANTONI S. BRONER, general manager. The board of directors is composed of C. F. BURGESS (Great Lakes), G. J. BROWN (Mass.), S. M. FARNED (Fairfield), R. H. FLICK (Concordville), J. H. KREISNER (Norwell), W. A. LEA (Pittsfield), G. E. MARTIN (Wellesley), F. P. MORRIS (Bosch), J. M. REEDILL (Douglas), P. H. REEDILL (Baldwin), W. E. VALE, JR. (Orvis), R. B. WILSON (Vultee).

RICHARD S. BREWSTER has been appointed State Coordinator, a new office inaugurated by the Bureau of Air Commerce. His chief duties will be to advise with state aviation officials in promotion of legislation, regulation and promotion of a great general interest in activities of commercial and private aircraft operators. After war time service with the Army Air Service, Mr. Brewster became state aviation director for Tennessee, then president of the National Association of State Aviation Officials. Since September, 1935, he has been development expert for the Bureau of Air Commerce.

W. J. CAMPBELL, for the last four years vice-president and general manager of Berry Brothers Detroit, has been elected president of the company.



GUY H. VANDERKAM



PETER ST. HILAIRE P. HEERY



FRANCIS H. REEDILL



ROBERT J. BARKER



GILBERT L. MARTIN

assuming his post as general manager. The retiring president, JOHN C. WILHELMSEN, remains a member of the board.

The Aeroplane Dealer of Commerce of America has reelected THOMAS A. MEEHAN president, and LUCILLE W. REEDILL vice-president. New officers are: vice-president, DONALD W. DUNLAP; receiver

FRUIT, and ALFRED FRANK, secretary; GENEVIEVE BERNARD, treasurer; CHARLES L. LAWRENCE, vice-president; FREDERIC W. BAILEY, and assistant treasurer. FRANCIS J. WALSH, EDWARD ROOSEVELT, also elected a vice-president, has since resigned.

Twenty-three years ago young SANTONI LUCY HENRY H. ABERNETHY started in the Army's aerial air mail service out of a rickshaw-like flight from College Park, Md., to Fort Myer, Va., and return. The crude mail was a Wright B pusher—the distance covered, some 30 miles. Last year Lieutenant-Colonel Abernethy, now a captain of Army Corps B-10 Marauders from Bolling Field to Alaska and return, covered approximately 3,000 miles. For the last three of these arduousness Lieutenant-Arnold was made the first recipient of the Mackay Trophy. For the second Lieutenant-Colonel, now Major-General, Abernethy, who has been decorated with an Army's most significant flight of the year, again receives the Trophy.

Flight Lieutenant T. ALLEN is now chief engineer for Edwards Air Lines, successor to the Edwards Air Lines Aviation Inc. After being discharged from the Army in 1929 Mr. Allen became test pilot for the National Advisory Committee for Aeronautics, then pilot for the Post Office Department. Since 1939 he has served in construction engineer for the Douglas, Republic, Lockheed, Curtiss-Wright, Boeing, General Aviation, Standard, TWA, and Pan American Airways. Most significant of his recent work has been the development of a scientific basis for the creating, control and transport operations. In addition to his new duties, engineer Allen continues as regular Wright consultant, as co-author of Attaratus's series of articles on engine control.

To make surveys of the Far Eastern Market, to promote there the interests of the United Aircraft Export Corporation, and to represent the company, Edward W. DUNLAP from East Hartford to Shanghai, China, Consulting engineer for Chinese Wright for the past three years, formerly head of the airplane section at Wright Field, then chief engineer for American Airlines and Regis, Mr. Dunlap moves assistant to the president of United Engineers in New York on his return.

Following the resignation of L. Harvey Goss to enter the advertising field in New York, Paul Brittan became general traffic manager of Western Air Lines. Mr. Brittan who

Amsterdam airports see [Aeroflot](#)

ANSWER: **False** **ANSWER:** **True** **ANSWER:** **True** **ANSWER:** **True**

Page 101

THE INFLUENCE OF PLANT DENSITY ON THE INTEGRITY OF PLANT COMMUNITIES

MULTI-ENGINELED TRANSPORT PLANES

卷之三

American airplane specimens (continued)

Answers should not exceed one sentence for the diagram given.

American eagle specifications

Answers due 1pm (London) Friday for the figure given



THE BUYERS' LOG BOOK

AVIATION's Card Index of New Equipment

This department is equipped to help readers locate manufacturers of any parts, accessories or materials

AIRPLANE ACCESSORIES

Aircraft Flares

Lorraine Laboratories,
607 Roosevelt Ave., Chicago, Ill.

IMPORTANT anti-chemical feature of Lorraine's, Inc. aircraft and aircraft radio transmitters is a 90 deg. rotor which the trouble lock at the center. End caps, tubes, and base elements are locked together with special solder. Low voltage types, glass enclosed, 25-250 volts. High voltage series, fiber enclosed, rated for 1,000, 2,500, 3,000 volt service.

AVIATION, April, 1943

AIRPORT EQUIPMENT

Emergency Light

National Carbide Sales Corp.,
Lewis Building, New York, N. Y.

A NEW 6/900 cu. in. emergency carbide light adaptable to aircraft use weighs 40 lb. when fully charged, burns three hours or longer when operated intermittently on a 1/16th charge. A new split feature is incorporated. Reflector mounted on a universal swivel joint, shifts light to any angle. Folds for carrying by handle above carbide housing. When extended to 11 in. height, 28 in. when folded.

AVIATION, April, 1943

AIRPORT EQUIPMENT

Fire Extinguisher

Pierre Manufacturing Co.,
Keweenaw, Mich.

NEW 2-qt. supporting liquid fire extinguisher discharges at 100 psi pressure. Delivers fan-shaped spray or solid stream. No built-in pump; pressure conceivable at any air line having 100 lb. pressure. Weight 164 lb. fully charged; 18 in. high, 3 in. diameter. Is operated by opening valve on top and controlling conduction discharge nozzle. Carrying case available.

AVIATION, April, 1943

ENGINE ACCESSORIES

Battery Ignition Units

Southern Magneto Co.,
Sydney, New York

NEW radio shielded linear, solid, ignition switch for aircraft aircraft engines is announced. Type WL timer half second mounted, switch packed, available for conventional timer mounting or for magnetic replacement base. Single or double breakers. Centrifugal spark governor built in. Ignition switch has independent battery and governor leads to safety feature.

AVIATION, April, 1943

RADIO

Aircraft Radio (catalog)

Lois Developments Inc.,
225 W. 17th Street, New York, N. Y.

COMPLETE descriptions of all Lois products and manufacturing facilities enclosed in new bulletin "Aircraft Radio." Covers the special equipment built for the Leader Maintenance men, also standard products, the Model K Directional Finder, the K-3 Head receiver, the Model GLACT-3 transmitter converter, and the 16 watt and 35 watt (GLACT-4) transmitter for the previous type.

AVIATION, April, 1943

RADIO

Airplane Receiver

Walter Electric Co.,
219 Broadway, New York, N. Y.

NEW weather and beacon signal service for the private pilot now receives minimum 70 cu. in. each way, weighs 11 lb., covers for 200-450 cu. in. to 350/1,500 cu. feet. Super-heterodyne circuit, only three tubes, requires short antenna, operates with carbonyne. Power supplied from 6 or 12-volt battery. Plate supply 16 milliamperes, at 90 volts, permitting use of dry cell battery.

AVIATION, April, 1943

RADIO EQUIPMENT

Radio Receiver

Shawky & Sons, Inc.,
Boston, Mass.

MODEL 518-2 beacon receiver, designed primarily for private pilot, is a four-tube superheterodyne, 144 to 420 kc frequency, with output of 250 milliwatts and sensitivity of 1 microvolt. Receiver designed for panel mounting but may be mounted where convenient as shockproofing not required. Equipped with shielded phone lead and pick hot 34 lb. for battery operation, with dimensions 14 in.

AVIATION, April, 1943

SHOP EQUIPMENT

Battery Tester

General Electric Co.,
Bridgeport, Conn.

TRIUMPH battery-cell tester may be used both for high-voltage discharge tests or for open-circuit tests. Permits to fit the hand of the operator. Large, easily read meter at top of handle (shielded by rubber guard for protection) has dual voltage scale, also subdivisions to simplify readings. Switch, of thumbwheel type, is between the two calibration plates battery pads.

AVIATION, April, 1943

B E N D I X

THE BEACON OF AVIATION SAFETY

AIRPLANE PRODUCTS

BRAKE WHEELS
High and Low Pressure "Streamline"

TAIL WHEELS
Low Pressure "Streamline"

AXLES
For All Wheels

BRAKES
Mechanically and Hydraulically Operated

OPERATING CYLINDERS
FOR HYDRAULIC BRAKES
with Flexible Hose and Fittings

TAIL WHEEL KNUCKLES
For "Streamline" Wheels
Steerable and Swiveling
with Shimmy Damper

PNEUDRAULIC SHOCK STRUTS
Designed and Tested to Meet Individual Requirements

PILOT SEATS
Standard Army and Navy Type

SENDIX PRODUCTS CORPORATION
AIRPLANE WHEEL AND BRAKE DIVISION - SOUTH BEND, INDIANA
(Subsidiary of Bendix Aviation Corporation)

It's Arms that

*She Takes To The Air On Wings—
But Rocker Arms Keep Her There*



Rocker Arms are subject to heat and pressure that quickly destroy ordinary grease. Maflik has demonstrated its ability to lubricate this tough job efficiently under extremes of operating conditions. It "lays flat." It minimizes wear, reduces time out of service, lessens the expense of engine overhauls.

*Especially Effective for
Controllable-Pitch Propellers*

When Northwest Airlines—"Shortest Route from Chicago to Seattle"—installed controllable-pitch propellers they found most greases caused trouble and expense—meant safety. They put Maflik on this job and said, "It doesn't chisel or gall

but remains in the assembly and assures constant lubrication for slides and counterbalances.

*Millions of Miles
of Flying Prove Maflik*

Leaders of commercial aviation such as "American Air Lines," "Bowen," "Central Airlines," choose Maflik because it is the most effective lubricant for Rocker Arms. It also provides a valuable extra margin of safety—speed—economy.

At all airports you will find Maflik and the complete line of Texas Fuels and Lubricants. A Texas representative will gladly help you select these best suited to your ship.

THE TEXAS COMPANY—130 East 42nd Street, N. Y. C.

TEXACO *Aviation* PRODUCTS



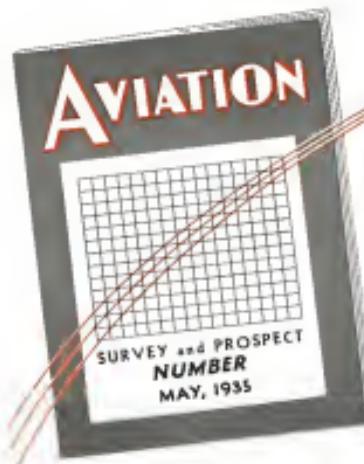
TEXACO AIRPLANE OIL—TEXACO AVIATION
GASOLINE—TEXACO MAFLIK—TEXACO ASPHALT
PRODUCTS FOR RUNWAYS, HANGAR FLOORS, APRONS
AND DUST LAYING.

THERE IS AN EXTRA MARGIN OF SAFETY, SPEED

hold her up!



AND ECONOMY IN TEXACO AVIATION PRODUCTS



— and now
for the record
and a look ahead

THIS aircraft industry is now headed for a period of steady expansion. Total production and sales during the fiscal year beginning July posterior to be greater than in any year since 1929.

An unprecedented percentage outcry of nearly \$2 million dollars for Army and Navy aircraft and engines, on all phases commercial aviation outlets, are the 1935 factors supporting that optimistic viewpoint.

In planning for this greater activity, the industry must largely be guided by its present capacity and attain record of performance. The facts and figures on all this broad basis must be studied and put to work.

Here then is presented an industry need which AVIATION plans to meet in its entirety.

Survey and Prospect Issue— Ready May 1st

This volume annual review is initiated by the industry and our national legislators as an authoritative factual publication showing the importance of the

American aircraft industry from the economic and national defense standpoints.

In this issue facts are gathered and interpreted -- are given interesting and definite applications to the industry's problems. Especially timely this year will be the editor's outline of future prospects.

This is the issue you have been waiting for -- it will contain basic information (much of it exclusive) covering airplane and engine design and production, transport activities, including reports on air mail, passenger and express business, data on airfields and ports, airport developments, foreign trade statistics, Army and Navy operations, etc. This is the kind of information the industry wants and uses in its planning, doch it seldom receives because it is presented and interpreted in a live, vital way. The regular news section and departments will appear as usual.

You will want this issue not only for its immediate value but to keep for reference throughout the year. The demand always exceeds the supply, so place your order in advance to avoid disappointment.

TO ADVERTISERS .

To fit your product into present thinking and planning tell your colleagues in the industry in this Survey and Prospect Number of AVIATION. Ready early in May, it is an issue the industry uses the year round.

AVIATION

Edited by Edward F. Werner

A McGRAW-HILL Publication, 330 West 42nd Street, New York, N. Y.

The NAVY invests

... in three KINNER ENVOYS
for transportation of personnel

The Envoys are superb four-place cabin airplanes equipped with the 300 h.p. Kinner Engine at 1750 R.P.M. It cruises 150 m.p.h. (guaranteed).

*Not built to sell at a
price, the construction
of the Envoys
permits the equipment of
the U. S. Navy*

Ample payload permits such extras as controllable pitch propeller, parachutes, etc., without eliminating a passenger. Standard equipment includes steel propeller, engine-driven generator, electric starter, radio, electrically-operated flaps, 90 gal. gas capacity.

KINNER AIRPLANE AND MOTOR CORP., LTD., Glendale, Calif.





Standardized Equipment of Some Device



A Reliant of "Aerobile" Products

H. W. LARKE
Energy-Vacuum Oil CompanyJ. B. BRAUDIS
Bell Petroleum CompanySTANLEY FOLKERS
Baldwin Oil Company

The Roll Call of an Industry

INTERNS
EXECUTIVE
TELEGRAM

M&P Building Company



Reed's Motor Thresher

WEN. TAYLOR
Borden Products CorporationWEN. H. HEDD-PEN. CO.
Henry L. Sherry & CompanyN. E. CAREY
Union Oil Company of California

The Aviation Departments of the major oil companies are headed by men of wide experience with aircraft. It is significant that so many of these Veterans of the Air have selected a Stinson 'Reliant' when there is need for the utmost in economy and reliability.

To all who are interested in the airplane as a business utility, we will be glad to mail a Brochure on the subject.

WORLD'S LARGEST BUILDERS OF CABIN AIRPLANES

**STINSON
AIRCRAFT
CORPORATION**

AVIATION MANUFACTURERS CORPORATION

Business Executives who have need for fast transportation by day and night have booked orders for this latest Stinson Airliner, fastest of all trimotors, and deliveries are being made this spring.

Built for those who demand the utmost in safety, comfort and economy, this Airliner, powered with three proven Lycoming motors, provides speedy trimotored transportation hitherto unobtainable at reasonable cost.

Ask for specifications.



**WAYNE
MICHIGAN
U. S. A.**

FORMICA



in the
STINSON
TRI-MOTORED
AIR LINER



• THESE handsome new ships have a quieter and more attractive cabin through the use of Formica on the interior. The ceiling is covered with decorative Formica sheet which has been perforated and provided with a loose fiber backing to deaden noise. There is a Formica wainscot up to the level of the bottom of the windows which is handsome, easy to clean, and

which will stand up to very hard use. The control pulleys also are Formica. A very large percentage of the new aeroplanes going into use employ some Formica.

Let us give the facts about the use of Formica sheet on cabin interiors.

FORMICA

THE FORMICA INSULATION COMPANY

622 Spring Grove Ave., Cincinnati, O.

NICHOLAS-BEAZLEY
AIRPLANE CO., INC.



GOES SHERWIN-WILLIAMS!

Nichol-Bearzley Airplane Co., with main offices at Marshall, Mo., and branches at Glendale, Calif., and Floyd Bennett Field, Brooklyn, N. Y., recently became distributors for the complete line of Sherwin-Williams Aero Finishes. To its customers this well known firm says, "You will be pleased with the results obtained from the use of these high grade products." Sherwin-Williams Aero Finishes include the right

material for every type of aircraft surface—dopes, thinners, Open Lacquer Enamels, Clear Maling Lacquers, Airline Spee Varnishes, Baking Enamels, Painting Compound, Lacquer Remover, Red Orieles, Metal Primers, Engine Enamels, etc. They are the best finishes for airplanes that human ingenuity, backed by the resources of the world's largest manufacturer of finishing products, can produce.

Write for this Free Book—"Airplane Finishing Specifications"

"Sherwin-Williams Airplane Finishing Specifications" is an overall finishing guide. It contains complete information on finishing materials, methods and systems. Includes standard data on all S-W colors in all Painted Shapes and Metal Form. • Please state air frame and metal finishing

Appearance—coats and ready for common airplane finishing finishes. This and other information is based on extensive experience and experience plus use under practical conditions by airplane manufacturers. Write The Sherwin-Williams Co., Cleveland, Ohio, or



SEE THE SHERWIN-WILLIAMS PAINT ENGINEER

SHERWIN-WILLIAMS PAINTS





SHERWIN-WILLIAMS PAINTS

B. P. JOHN

PORTLAND, OREGON

B. P. John continues a long and living tradition, leading West Coast furniture manufacturers believe in complete control from one man's shop to another. If you are a purchasing factor for wood products, always assure the supplier of these finishes in sufficient quantity of material to their customers.

That's just what B. P. John means when Sherwin-Williams and the thousands of other Sherwin-Williams paint dealers produce 100% of all finishing materials from a Pennsylvania, 100 miles from the coast, factory that B. P. John and his sons have built up to be one of the best quality finishes, stains and other products. Their just emphasis is their continued use of the name of their business, but also the name of the Sherwin-Williams research and technical organization. This close cooperation is the secret of the products' success—engineered products made by building reliable, made-to-order supplies, which now are well known as economic judges.

FREEMAN SHOE COMPANY

EDEN, WISCONSIN

To the shoe industry goes credit for developing practical demonstrations of the value of color in plant maintenance and management. The B. P. W. and the B. P. W. Wright Co. in the East, rendered all machinery in their respective plants, black, white, grey, and other colors, with other companies having no knowledge of the value of such. Such experiments have proved generally successful.

KOOL CIGARETTES
ATLANTA, GA.

The Koal Program came along through the air above the Southeast in Atlanta, Georgia, and the Koal Program has been endorsed against the black of the night. It makes them easier to get in because, B. P. W. Koal Bulletin White is used to reflect the light. These Koal cigarettes are more certain about keeping their machine up and spic condition, ensuring a minimum of breakage. The Koal Program is based on B. P. W. Koal Bulletin, and the colors and health are amazing—spurts of energy of any Sherwin-Williams paint product.



MARTZ BUS
WHEELERSBURG, PA.

A few interesting statistics of the Franklin Motor Coach Co., largest independent bus fleet in AMERICA:

	110
Cup Type Buses	55
Coat Wreaths	20
Midsize (1914)	10
Fullsize (1914)	80
Operations Hours (1914)	30,000,000

This means service, wear, strain, and all sorts of rough, tough service. Motor cars are not built to stand up to such use and under maximum loadings for every job in every garage. These Franklin products stand up to every job in every garage. They are built to stand up to drawing longer life and lower advertising costs. Sherwin-Williams engineers are learning and teach them to better, longer life.

TOBACCO PLANTS

Conditions within a tobacco plant are such that enough to try the patience of any paint. Tobacco factories have a high ambient temperature that leads to the paint flowing on the part of most stiff when and being high humidity of tobacco moisture and the resulting paint being too liquid. When a tobacco plant is in constant motion, water actually runs in certain parts of windows onto window sills, and the paint is washed off. The enormous possibility of moisture and fungi, the inaccessibility of painting exterior parts of buildings, and you have a big painting problem.

Since late, because of the wide acceptance of Sherwin-Williams products, we are able to offer a special paint. It is a special ordinary white special formulation to overcome—where the soil where most tobacco is grown in the soil. General Cigar Company, for example, has used the Sherwin-Williams paint for their tobacco plants.

ERWIN COTTON MILLS
ERWIN, N.C.



Sherwin-Williams has always been famous for women's house paints. She usually makes large quantities of paint to help in keeping the houses of their employees in the best of shape. Here are some of the colors of the house paint that we have. Cotton Mills, painted and treated with Sherwin-Williams Paints.

Sherwin-Williams Paint serves the textile industry in many ways. It is not always necessary to use paint. There are certain colors that do not reflect the light. These colors are the best that what applies to paint colors also applies to oil and varnish products. We are pleased to say that we have made and better work.

THE SHERWIN-WILLIAMS CO.

Administrative Offices: CLEVELAND, OHIO & Sales offices, factories and warehouses in principal cities

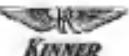
World's Largest Manufacturer of Paint, Varnishes, Lacquers, Enamels and Stains

AVIATION
April, 1935



MENASCO
AIRCRAFT ENGINES

Aeromarine



THE CHOICE OF THE ENGINE MANUFACTURERS



THE B. G. CORPORATION

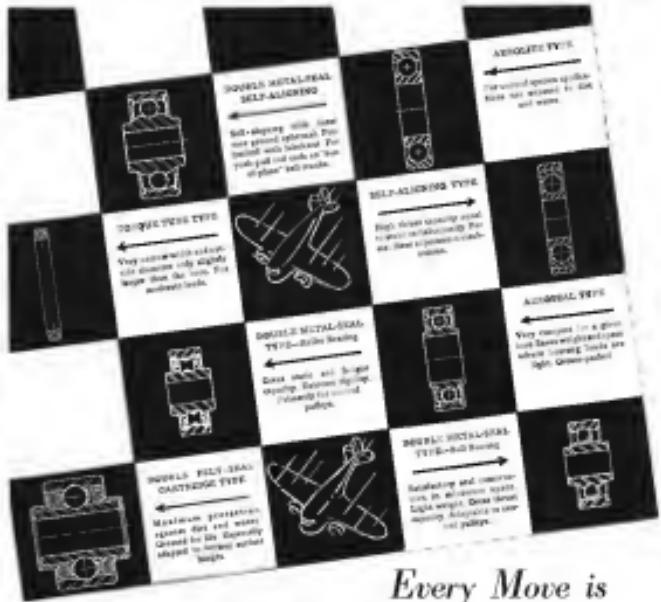
Contractors to the United States Army and Navy and Aircraft Engine Builders

136 W. 52nd ST., NEW YORK

Tele. Address: Balmoral, New York



Patented in the United States
and other countries



Every Move is FRICTION-FREE with FAFNIR

Fafnir makes the most complete line of types and sizes for aircraft control produced by any bearing manufacturer. First to supply Aircraft Bearings to the Aviation Industry, Fafnir remains the standard among aircraft builders... first in design, engineering service and general acceptance. They are the most widely used of all aircraft bearings and are in regular and continuous use by almost every aircraft builder of planes. THE FAFNIR BEARING COMPANY, New Britain, Conn. Atlanta... Chicago... Cleveland... Dallas... Detroit... Milwaukee... New York... Philadelphia

Builders of the Original Aircraft Bearing Line



Fafnir Axle, Bearing,
FAFNIR BEARING CO.
AIRCRAFT Division
1000 Franklin Street
New Britain, Connecticut
Manufacturing Plants
Atlanta, Chicago, Detroit, Milwaukee, New York, Philadelphia

Advertisement

FAFNIR BALL BEARINGS

WACO PICKS GOODRICH FOR SAFETY!

EQUIPS LATEST 1935 MODELS WITH GOODRICH LOW PRESSURE TIRES



(Left) The new Waco Model 75 has plenty of appeal for the sportman pilot.



(Above) One of the new Waco Model 75s.

**EARL W. H. PERRY,
SALES MANAGER, WACO
AIRCRAFT COMPANY, SAYS:**

"Our selected decision to use Goodrich Airplane Tires was the outcome of careful investigation of every type of tire. Since then our experience has shown that Silvertowns were the best. In addition we could have logical tires. We have obtained confidence in their safety which induces us to specify all models first that we supply all models first with Airplane Silvertowns."

EVERYWHERE YOU FLY, SEE HOW MANY TIMES YOU TAKE OFF ON GOODRICH AIRPLANE SILVERTOWNS



WACO is already flying its 1935 stride! With new designs, new performance.

Yet—note this! All Waco models continue to have Goodrich Airplane Silvertowns on the wheels. This induction of the new for—year after year—can only mean that Airplane Silvertowns have "stood up." Even if speeds are higher— even if changes are made in design, Waco engineers know that Goodrich Low Pressure Tires can be depended on for safe landings and take-offs.

EXTRA STRENGTH
Goodrich Airplane Silvertowns

have the sheer toughness that can absorb sudden impact from rotary fields. Tires have "ground contact" areas—another design and trademark. If you want a tire that can land your plane hundreds of times and still hold up—still be successful, get Goodrich Airplane Silvertowns. Why delay? See your nearest Goodrich dealer, or write Dept. 690, Aerovational Division of the B. F. Goodrich Co., Akron, Ohio, for complete information about Goodrich Airplane Silvertowns and 48 other Goodrich rubber products for airplanes.

Goodrich Airplane Silvertowns
THE SAFEST AIRPLANE TIRE EVER BUILT

Over 40 Rubber Products for Aviation—Including Tires—Tire Wheels—Rubber Sheets—Doors—Hinges—
—Rubber Hose—Gumrope—Black Absorber Cord—A Complete Line of Rubber Aerovational Accessories.



Editor-in-Chief
GEORGE S. HAVEN
in charge of Textile
Research, Massachusetts
Institute of Technology.

New... Just off the Press... Handbook of Industrial Fabrics

Published by Wellington Sears Company

Contains Result of Test on Grade A—Aeronautical Fabrics

The new handbook includes on pages 349 to 354, the results of a comprehensive comparative test made upon the leading Grade A Aeronautical Fabrics.

One complimentary copy of the handbook will be sent free to any Aeronautical organization in the United States having responsibility for aircraft flying, upon request of official aeronautical engineer, who sends in his business, association and trade influences for prompt. Additional copies may be had at the price of \$3.00 each.

Wellington Sears Company is the representative for aeronautical fabrics with a listing of 1,400 different various fabrics and is especially well known in the Aeronautical industry as the originator and distributor of BA-30 Fabrics.

BA-30 Balloon and Aeroplane

was originally designed over two years ago as an improvement over the then existing fabric available. A self-imposed weight maximum of 4. ounces in the square yard had been selected to meet the beginning. Furthermore the elimination of any search for a strong was accomplished, in BA-30 Fabrics you get all the strength.

It is, therefore, the desire of the inventors to that both the Army Air Corps and the Navy have approved in their testes and are Specification for Grade A Fabrics a weight maximum of 4. ounces and a size content not to exceed 1. person.

WELLINGTON SEARS COMPANY
65 WORTH STREET, NEW YORK CITY

BOSTON, PHILADELPHIA, ATLANTA, NEW ORLEANS, DETROIT, CHICAGO, ST. LOUIS, SAN FRANCISCO



PAN-AMERICAN'S MIGHTY MARTIN CLIPPER IS EQUIPPED WITH

PRECISION BEARINGS

Again aviation engineering pays its tribute to time-tested Norma-Hoffmann dependability. Again Norma-Hoffmann Precision Bearings play their part in an outstanding achievement in the world of flying.



Norma-Hoffmann Precision Bearings are used in every part of the aircraft. Including superchargers and compressors, propeller, engine, tail and rudder, ailerons, control surfaces, steering, transmission, radio equipment, motors, and heating and cooling. Let our engineers work with you.

The Glenn L. Martin Company's 48-passenger "Flying Clipper No. 2", America's largest transport plane, employs Norma-Hoffmann Precision Bearings in its four 1000 HP. Pratt & Whitney "Twin Wasp" engines—in its Sperry Hydraulic Automatic Pilot, and Directional Gyro—and in its aileron, rudder and elevator control system, and fuel valve remote control system. * * * * For dependable power, dependable navigation, and dependable control, this "giant of the air" relies upon Norma-Hoffmann Precision.

Where the bearing must not fail—on land, at sea, or in the air—Norma-Hoffmann Precision Bearings are the choice of designers and engineers. Write for the Catalog.

NORMA-HOFFMANN BEARINGS CORPORATION, STAMFORD, CONN., U. S. A.

PRECISION BALL, ROLLER, AND THRUST BEARINGS

SCINTILLA

AIRCRAFT IGNITION

LEADERSHIP in the aircraft ignition field is best evidenced by the industry's continued choice of Scintilla products. When new planes or new engines appear, Scintilla ignition forms an integral part of their equipment—custom-built to the high standard of performance, dependability and endurance which makes possible the wonderful accomplishments constantly scored by American aircraft.

Scintilla Magnets have participated in so many aircraft achievements that their use is taken for granted whenever new records are made. They are available for every type of engine, embodying the last word in ignition development.

ANNOUNCING

SCINTILLA AIRCRAFT BATTERY IGNITION

Several years of development have produced a new type battery ignition which in every way measures up to Scintilla standards. It is now in manufacture for popular types of aircraft engines, fully radio-shielded with either conventional or magneto replacement mounting. The performance of this product sets a new standard for aircraft battery ignition.

Scintilla Ignition Switches, A Series, are vibration-proof, corrosion-proof and weather-proof. They are made for practically every type of ignition installation. In addition, various types of selector switches are supplied for use with thermo-couples, for radio installations and other purposes.

Scintilla Service is provided at all principal airports throughout the country by organizations of long experience in their field.

SCINTILLA MAGNETO CO., INC.

(Subsidiary of Borden Aviation Corporation)

SIDNEY, N. Y.

AIRCRAFT IGNITION

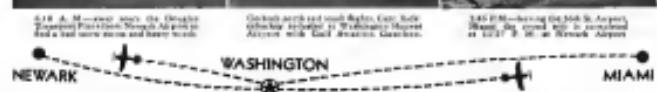
TRANSPORT PLANE CONQUERS SNOW STORM and HEAD-WIND with GULF'S NEW AVIATION GASOLINE



Capt. Eddie Rickenbacker commanding Eastern Air Lines plane on its winning flight



FLYING NEWARK-MIAMI ROUTE



5:15 A. M.—eastbound, Capt. Eddie Rickenbacker flying from Newark Airport on first trans-Atlantic and heavy record.

Gulf aircraft en route, Capt. Eddie Rickenbacker arriving at Washington Airport with Gulf Aviation Gasoline.

5:45 P. M.—arriving at Miami Airport, Miami, the record was so punctuated at 11:57 P. M. at Newark Airport.

NEWARK WASHINGTON MIAMI

CAPTAIN EDDIE RICKENBACKER, in charge of a Douglas Transport Plane from Newark to Miami, and return, and carrying 16 passengers, broke all records. He achieved even more. For he conquered a terrific snow storm, braved a vicious head-wind, and overcame a number of other factors according to a fascinated public the advantages of air travel.

And—he brought fresh laurels to Gulf's new Aviation Gasoline, on which he placed full dependence, by piloting his twin-motored Eastern Air Lines plane 7,400 miles in 37 hours and 17 minutes under adverse conditions.

No wonder that Eastern Air Lines and other leading transport companies insist upon refueling exclusively with Gulf Aviation Gasoline. Time and fuel have proved consistently in quick starting, without sputtering, and smooth engine performance. It is made from the finest of crude oils and refined with the greatest care.

Sign the coupon below for further proof of Gulf's progressive place in the aviation industry. A sample of its popular new Gulf product will be gladly sent to you upon request. Gulf Refining Company, Pittsburgh, Pa.

Send for the Free New Product Sample

GULF REFINING COMPANY
Pittsburgh, Pa.

Please send me 100 samples of your new products which make possible the smooth running and saving of engine-worn materials by long service and eliminate the cleaning of motor oil without washing the motor parts.

Name _____
Address _____



GULF REFINING
COMPANY



Dry and night, at regular intervals these words flash from planes in flight to airport stations throughout the United States. They tell their own story of Boeing Craftsmanship, Durability and Performance.

U. S. Army Air Corps, United States, Pennsylvania Airlines, United Parks Service, Western Air Express, Wyoming Air Service



BOEING HAS ALWAYS BUILT TOMORROW'S AIRPLANES TODAY!

Scales That Record

PLANE PRECISION

Roll On 30 SKF Bearings

- **SKF** makes persistently **30** types of **airplane** precision bearings. When **SKF** maintenance is **standard** type **30** bearings **last** longer, **run** smoother, **depend** upon **SKF** for **exact** **alignments** and **uniform** **fit**.



MORE THAN
1200
TYPES
AND
SIZES



SKF
BALL AND ROLLER BEARINGS



SKF-EQUIPPED

BUILT BY TOLEDO SCALE CO.

Here are **30** **SKF** **Self-Aligning Ball Bearings**, each carrying **3,000** **pounds** on **ball** **ends** with **accuracy** that results in only **1/10**-**pound** **error** in these **Toledo** **Printweigh** **scales**.

No wonder **SKF** performance dominates from the instant the Langley Field operator presses a button that starts **SKF**-equipped fans driven by two **SKF**-equipped 4,000 **HP.** **motors**, and releases a 115-mile **hurricane** in the world's largest wind tunnel! No wonder **SKF** issued accuracy enables Toledo scales to register a positive record of the plane's position at all times!

No wonder that when pioneering minds sought an effect that would be practically impossible by human recording, they followed the methods of men who choose bearings for the biggest, the smallest, the fastest, and the most intricate jobs in the world! They bought, specified, and preferred **SKF**. **SKF INDUSTRIES, INC.**, Front St. & Erie Avenue, Philadelphia, Pennsylvania.



**JOURNEYS THROUGH AN
APPLE SKIN**

If you compare our world to an apple, all the air we fly up and down in wouldn't be as thick as the apple's skin. Yet lots of things happen in this thin earthly skin of air to make our thick-fell that Ethyl's in the tank, and that the engine is thoroughly primed with the gas it breathes. Ethyl Gasoline Corporation, New York City.



**THE THIRD PILOT
flies THE PLANE**



The pilot and co-pilot need no longer be helmsmen. The SPERRY GYROPILOT flies the plane safely and with precision while the pilot and co-pilot attend to their varied duties as captain, navigator and radio operators.



SPERRY GYROSCOPE CO., Inc.
BROOKLYN — NEW YORK

PRIVATE FLYERS...

Here's your radio!



17A Double-duty Receiver

Bacon Band—300 to 410 KC
 Broadcast Band—530 to 1500 KC
 Measures 3 1/4" x 7 1/3" x 7 13/32"
 Weighs 2.1 lbs. with tubes and mounting
 Operates from storage battery or dry cells.

READY NOW... The Western Electric 17A double-duty receiver covers both Department of Commerce and broadcast bands. Designed especially for private planes, it is a three tube superheterodyne, equipped with a special static reducer which assures clear reception at all times. Used by major transport lines as a reserve unit, the Western Electric 17A is thoroughly dependable!

COMING SOON. ■ ■ A simple "hanging" attachment—built to Western Electric standards of reliability—for use in conjunction with the 17A receiver. AND... the new Western Electric midget transmitter to give private flyers compact, dependable 3-way radio telephone!



For further information about Western Electric radio for private planes, transport planes or ground stations, write to Western Electric, Dept. 253 A, 185 Broadway, New York.

Western Electric
 Aviation Communication Systems
*Western Electric in Canada

Western Electric equipped over 1000
 by McAll B. duPont of Wilmington, Del.

PIONEER

"RATE OF CLIMB" TYPE 925

QUICKER RESPONSE TO ALTITUDE CHANGES
 FOR FASTER MANEUVERING SHIPS



Climb Indicator, type 925, mounted in a smaller case, is the latest addition to Pioneer's extensive line. This instrument is the result of fifteen years experience in the building of Rate of Climb Indicators.

PIONEER INSTRUMENTS

PIONEER INSTRUMENT COMPANY INCORPORATED
 BROOKLYN - NEW YORK A SUBSIDIARY OF THE BENDIX AVIATION CORPORATION

PRIVATE



Seaplane - National Sport



Seaplane - Sport



Wren Sport



Bantam Sport



Pintail Sport



Seafair Sport



Seavader Aerotwin

EDO EQUIPS
ALL TYPES OF
PLANES FOR
WATER FLYING

EDO has designed and built floats upon which over 120 distinct types of land planes have been flown as seaplanes. This list includes a private, transport, mail, racing, and racing plane, as well as a landing gear plane and monoplane. Of this number over 70 different commercial types have been tested and licensed in the United States and Canada. For literature and complete data of EDO Floats, Inter-Commerce and Land Gear, address:

Edo Aeronautics Corporation, 680 Second St., College Point, Long Island, N. Y.

EDO
FLOATS

TRANSPORT



Seafair Transport



Gullwing Transport



Pintail Transport



Seafair Transport

MILITARY



Curtiss-Wright Flying



Douglas Observation



Wren Flying



Curtiss-Wright Pursuit



Gullwing Pursuit



Consolidated Tugboat



Bellanca Bomber

UPHOLSTERY IS IMPORTANT

VELMO

has proved it for
53 years!



Passenger plane used for the execution of a New England coast for time-saving business men. Cabin seats are upholstered in Velmo mohair fabric specially designed by Goodall-Sanford.

IN AVIATION, as in the history of all transportation, the passenger's comfort, the cabin's luxury, are now in fine for attention. What about upholstery?

Why have railroads used Velmo mohair fabrics for over 53 years? Why have fine motor cars used this fabric since closed models were first built? Because no substitute for the wearing qualities of a fine mohair has ever been found!

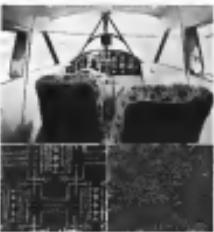
VELMO IS COOL. Its cool pile provides a little air cushion between the passenger and the seat.

VELMO PREVENTS FRICTION. Its pile is hard to scratching. There is no constant rub against a hard surface.

VELMO IS CLEAN. The sensitive mohair fibers do not collect dust and dirt. It reduces upkeep costs.

VELMO IS STURDY. No fabric known will take the punishment of day-in-and-out wear like a mohair.

The Goodall-Sanford mills have grown up with American transportation. Their knowledge of its upholstery needs is at your service. Before you equip a plane... or a fleet... get the data that will improve its comfort and luxury in service!



Interior of Bessie's cabin, seats covered with
premier Velmo mohair fabric of Peters' plane
which won.

VELMO UPHOLSTRIES
VELMO DRAPES

1 Goodall-Sanford
INDUSTRIES

L. C. CHASE & CO., Inc., selling subsidiary of Goodall-Sanford, 295 Fifth Avenue, New York
BOSTON CHICAGO DETROIT SAN FRANCISCO

TRANSIT COMPANY EXECUTIVE
COVERS FAR-FLUNG TERRITORY
IN WACO CABIN PLANE



The Mayflower Transit Company of Indianapolis, Indiana, America's foremost movers, solved their most perplexing problems in 1934 with a WACO Cabin Airplane. One of these problems was to maintain personal contact with 300 warehousemen located in every state in the Union.

Their first aero 10000 miles solves many pressing problems for the Mayflower Transit Company—prompting other, present contact with 300 warehousemen in every state in the Union.

*

Cabin would give them radio satisfaction and enable them to accomplish much more with greater ease."

In commenting on the operation of the WACO, Mr. W. Burnside Smith, President of the Mayflower Company says, "To our surprise the cost of operation per mile does not exceed that of an automobile, and we are sure that if more commercial firms would purchase a plane and put it to similar use they would find that the WACO

in the WACO Police. Copies of that publication may be had upon request.

One of our WACO dealers may be located in your city. He can assist you in covering your territory or opening up new territory with a saving in travel costs and time and without adding to your personnel. We suggest that you see the WACO dealer today. Ask him for the Mayflower Company's story if you do not know his name write at direct. The Waco Aircraft Company, Troy, Ohio.

WACO LEADS IN AIRCRAFT REGISTRATION



Again Waco writes
Air History



THIS TIME WITH A NEW 4-PLACE CUSTOM CABIN WACO

* Here truly is the last word in load-carrying, payload, and recommended air transportation. The new WACO further emphasizes WACO leadership in design, construction, performance and outstanding value.

Dimensions and lines present an exceptionally clean, fast speed, unique and 80% of the available fuel. This means lower gas consumption, lower operating cost, and longer engine life. Improved landing and streamlining after many months of accomplishment without sacrificing the advantages of the WACO patented design which has contributed so much to the outstanding performance of all WACOs.

Approved for pilot and passengers to fly in pairs, the new 4-place version of the Custom Cabin WACO. Front seats are each fully 27" wide. Rear seats 27" wider than in previous models and three to 67" apart from space between front and rear seats. Then, too, there

is increased area in luggage compartment. Room for four average Gladstones luggage all luggage is easily available through an inside door during flight. Luggage is loaded through an outside door.

The Custom Cabin WACO is offered

with the following power plants and operating speeds: Continental, 132 miles; Jacobs, 137 miles; Wright, 145 miles; all based on 1000 R.P.M. Recommended performance figures will be supplied through any WACO dealer nearest to you direct upon request.

OTHER FEATURES OF THE CUSTOM CABIN WACO

Reinforced steel frame—solid speed—improved visibility. * Indirectly lighted, new glass instrument panel—ample room for night or blind flying instruments. * Direct coupling electric motor. * Safety glass in windows and front door windows—top and rear windows non-crushing Phenolic. * Steering column and front seats adjustable fore and aft. * Steering control mounted on strong column. * Flaps independently controlled—not connected with stabilizer adjustment. * Balance bar on surfaces for converting wing bracing when using tanks are used separately, adjustable in flight.

THE WACO AIRCRAFT COMPANY, TROY, OHIO



WACO LEADS IN AIRCRAFT REGISTRATION

Standard on Leading Airlines


Cylinder Performance Indicator
Model 1001Air Temperature
Indicator Model 101Wind Heading
Indicator Model 101

WESTON
*Electrical
Instruments*

Tachometer
Indicator Model 101Radio Compass
Indicator Model 101Tachometer
Indicator Model 101Tachometer
Indicator Model 101Tachometer Indicator
Model 101Cylinder Performance
Indicator Model 1001

VS-3

SQUADRON

**EQUIPPED WITH HAMILTON
STANDARD CONTROLLABLES**

Operating under the severe conditions of Carrier service with the Fleet, this crack Scouting Squadron is now flying Grumman SF-1 Scouts equipped with Hamilton Standard Controllables. Other Army and Navy squadrons are currently being equipped with this propeller which has demonstrated its dependability in millions of miles of flight.

HAMILTON STANDARD CONTROLLABLES

Hamilton Standard Propeller Company, East Hartford, Conn., Subsidiary of United Aircraft Corporation





Mc G R A W - H I L L

American Machine
Aeronautics
Bus Transportation

Business Week
Chemical and Metallurgical Engineering
Civil Age

Construction Methods
Electrical Manufacturing
Electrical Wire



TO NEW IDEAS?

[With a very few exceptions, America's important industrial plants welcome McGraw-Hill circulation representatives—grant them the privilege of visiting "any department at any time." These exceptions we call "non-concessor" plants. Each month finds their ranks thinner. But a few still remain . . . and this advertisement is addressed to them.]

IF YOU'VE ever been called on by a McGraw-Hill circulation man, you know he's not an ordinary solicitor. He isn't "working his way through college"—he's been through. His job is more than just to sell magazine subscriptions. It's to see that the man in your company who can profit most from McGraw-Hill publications are reading them—and reading the right ones.

There may be thousands in your organization, yet the McGraw-Hill man wants to see only that handful of "key men" who need these magazines. He wants your power plant chief to keep alert by reading Power, your design engineers to keep posted on the newest ideas through Product Engineering. He wants your department heads, superintendents and engineers, your responsible officials in all branches, to read the particular McGraw-Hill publications intended to help them in their jobs. When

your men change from one department to another, when new men join your staff, he wants to help fit McGraw-Hill's editorial service to each man's individual job.

You may be doing a marvelous job of welfare work for your employees, yet overlooking an opportunity for letting your key men make themselves more useful and more efficient in their jobs. You may be a "non-concessor" plant without your knowing it. It will pay you to inquire whether the McGraw-Hill man is privileged to carry on his valuable service in your organization. If he isn't—please open the gates to him! You'll be opening them to new ideas, new opportunities and greater alertness in your personnel.

WARNING!

Every McGraw-Hill representative carries an identification card. Before giving any subscription order, please ask him to show his credentials. Or, in advertising by mail, ask me and money to anyone from the McGraw-Hill Publishing Co., 120 West 45th Street, New York City.

P U B L I S H I N G C O M P A N Y, I n c.

Electrical World
Engineering
Engineering and Mining Journal

Engineering News-Record
Faculty Management and Maintenance
Food Influences

Metall and Mineral Markets
Power
Product Engineering

Radio Broadcasting
Textile World
Tourism Journal



But you're not selling to elephants

ELEPHANTS never forget—but men do! Whether you carry your goods will at a dollar or a million, it's yours only as long as you hold on to your market. Only as long as you keep showing your prospects why they ought to buy your product or service.

That holds for everything business and industry buys, from name plates to tracks. The formula for success in any sales drive is still a good product, a good sales force and good, consistent advertising.

The terms "elephant sales" advertisement is being used to indicate large sales and advertising budgets are appreciated. McGraw-Hill

Publications offer you the economical way to do that "good, consistent advertising" in Industry's 12 Major Markets. That way, it is send your message directly and easily to the men who count in the companies that count . . . through the magazines these men buy and read regularly to keep up with their jobs

Don't wait for business to come to you. Go after it—before your competitors do. And, for your biggest dollar's worth, go after it through the waste-free circulation of McGraw-Hill Publications.

McGRAW-HILL PUBLISHING COMPANY, Inc.
330 West 42nd Street, New York City

McGraw-Hill Books
Books for Transportation
Books for Business

Classified and Management
Books
Cost Accounting
Management Methods
Books of Marketing

Industrial and Technical
Books
Cost Accounting
Management and Marketing
Books

Engineering News-Record
Future Management and
Manufacturing
Engineering
Metals & Mineral Markets

Books
Periodicals
Engineering
Metals & Mineral Markets

Examine
any of these
McGRAW-HILL
BOOKS
on Aviation
for 10 days free

1. SEAPLANE DESIGN, by William Miller. 216 pages, 6 x 9, illustrated. \$1.50
2. AVIATION HANDBOOK, by Edward P. Werner and Paul Johnson. 762 pages, 6½ x 9, illustrated. \$1.50
3. THE AIRPLANE AND ITS ENGINE, by Charles H. Chastfield and Charles J. Taylor. 494 pages, 6½ x 9, illustrated. \$1.50
4. AIR NAVIGATION, by E. F. H. Wren. 310 pages, 6 x 9, illustrated. \$1.00
5. AIRPORTS, by Henry R. Holland. 272 pages, 6½ x 9, illustrated. \$1.00
6. AERODYNAMICS, by Charles J. Maguire. 136 pages, 6 x 9, illustrated. \$1.00
7. AERIAL AND MARINE NAVIGATION TABLES, by John E. Glogau. 144 pages, 7 x 10. \$1.00
8. APPLIED WING THEORY, by Elton G. Brad. 232 pages, 6 x 9, illustrated. \$1.00
9. AIRCRAFT PROPELLER DESIGN, by Fred E. Finsch. 276 pages, 6 x 9, illustrated. \$1.00
10. FUNDAMENTALS OF HYDRO- AND AEROMECHANICS, by L. Prandtl and O. G. Tietjens. 379 pages, 6 x 9, illustrated. \$1.00
11. APPLIED HYDRO- AND AEROMECHANICS, by L. Prandtl and O. G. Tietjens. 379 pages, 6 x 9, illustrated. \$1.00
12. AIRPLANE CONSTRUCTION AND REPAIR, by E. F. H. Wren. 420 pages, 11 x 9, illustrated. \$1.00
13. THE AIRCRAFT MECHANICS HANDBOOK, by J. W. Miller. 174 pages, 6½ x 9, illustrated. \$1.00
14. MARINE MECHANICAL ENGINEERS HANDBOOK, 2334 pages, 6½ x 9, fully illustrated. \$1.00
15. RADIO ENGINEERING HANDBOOK, Edited by Capt. Keith Henney. 113 pages, 6½ x 9, illustrated. \$1.00
16. RADIO OPERATING QUESTIONS AND ANSWERS, by Arthur C. Silcox and J. L. Henney. 117 pages, 6½ x 9, illustrated. \$1.00
17. A HISTORY OF AIRCRAFT, by F. Alexander Maguire and Otto Hilditch. 900 pages, 6 x 9, illustrated. \$1.00

ON-APPROVAL COUPON

McGraw-Hill Book Company, Inc.
100 West 42nd Street, New York, N. Y.

Send me the books listed in above for 10 days examination period to approve or return. Within 10 days of receipt I will pay postage. If I keep the books for a few more days for postage and delivery and return the books postpaid. The one reason or notice necessary is that the books are unsatisfactory.

Name _____
Address _____
City and State _____
Date _____
Please mail on approval to F. S. and Sons, 442-2



MACWHYTE TIE RODS

Standard equipment
on almost all America's
aircraft.
— Standard
■ Special
● Board

• Macwhyte has been foremost in the development and perfection of aircraft tie rods, working in close harmony with aircraft manufacturers as well as the Army and Navy.

MACWHYTE AIRCRAFT STRAND and CORD

• For controls—1 x 19 mm. flexible, 6x7 and 7x7 strands, 7x19 ends. Flexible, Preformed and Non-Preformed—Tinned, Galvanized and Zincated Steel Made to meet Army-Mcwhyte specifications by wire rope specialists in the Macwhyte factory.

MACWHYTE COMPANY
KEDNOSE, WISCONSIN

FOR SAFETY AND ECONOMY



The new twin Skymaster and Boeing "Clipper" are the latest developments in long distance flying. Both in South America are passenger routes. Pan American uses Exide.

leading transport
lines depend on

EXIDE



THERE are sound reasons for the almost universal preference for Exide among the large transport operators of the country. The unfailing dependability of Exide meets their first and most important requirement. And they have found that, in using Exide, they pay no premium for safety. Instead, Exide save money, with their long life and low maintenance costs.

It is in maintenance, especially, that Exides show up to advantage. They demand a minimum of attention, and respond to the care you give them by delivering longer service with added dependability.

An important improvement now adds to the value of Exide Aircraft Batteries. They are

equipped with the new Exide Mipor Separators—the permanent storage battery plate insulator that is immune to electrolyte, heat and vibration.

Let Exide Engineering Service help to lower your battery maintenance costs. Our engineers have an exceptional background of aircraft battery experience, and will gladly work with your operating and maintenance men. Write for detailed information.

THE EXIDE STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturer of Storage Batteries for Power Plants
Trade Batteries of Canada, Limited, Toronto

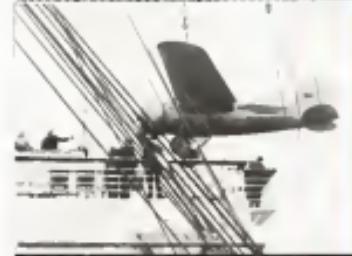
Exide
AIRCRAFT
BATTERIES

WITH EXIDE MIPOR SEPARATORS
"EXIDE" Reg. U. S. Pat. Off.



"EVERYTHING OKAY"

Missie Earhart's Lockheed Flier
being loaded aboard a plane at
San Diego, bound for Honolulu.



Here is the log of Amelia Earhart's recent solo flight from Honolulu to Oakland, California.

FRIDAY

12:10 p.m. Amelia Earhart left Wheeler Field, Honolulu.

SATURDAY

1:20 a.m. Miss Earhart refueled briefly "all alone" as was arranged when she was 300 miles from the coast.

8:47 a.m. Miss Earhart reported visibility "fair" 8:50 a.m. "Everything when flying 4000 feet, solid clouds."

9:48 a.m. "Everything okay," Miss Earhart reported.

10:45 a.m. Miss Earhart reported "everything flying at 7500 feet weather clearing." Her nose showed no signs of fatigue.

11:37 a.m. Miss Earhart reported "skies overcast, 10000 feet."

12:40 a.m. "Everything okay" Miss Earhart was signal, will set endurance record.

12:48 p.m. Miss Earhart flying over top landmarks, "all okay" 2:40 p.m. Earland at 10,000 feet, shadow vision for giving her position.

4:50 p.m. Miss Earhart landed at Oakland Airport.

That nonstop transoceanic flight goes on the records. And again Thompson Valves played an important part in the making of America's second greatest lady. "Everything okay."

Frank A. Whitney
"WASP"



The cross to Hawaii—Miss Earhart's only landing at 10,000 feet after completion of the first solo flight from Asia on March 26th in the plane she mentioned. The Price & Whitney Corp. supplied the aircraft with Thompson Valves.

Thompson Valves

THOMPSON PRODUCTS, Inc., Cleveland • Detroit



*Prompt, push-button starting
from the cockpit!*



ECLIPSE

DIRECT CRANKING ELECTRIC STARTERS

For continuous high speed cranking of the engine with exceptionally low current consumption. Automatic engagement and disengagement with complete protection against back-fire. Available in a wide range of capacities for operation from 12 or 24 volt battery current.

ECLIPSE AVIATION CORPORATION

EAST ORANGE, NEW JERSEY

(Subsidiary of Bendix Aviation Corporation)



Type Y-150
Approximate maximum engine capacity—145 H. P.



Type E-80
Approximate maximum engine capacity—250 H. P.



Type E-160
Approximate maximum engine capacity—700 H. P.



Type F-141
Approximate maximum engine capacity—300 H. P.